

The background of the entire page is a stylized, layered mountain range. The mountains are represented by various shades of green, with darker tones in the foreground and lighter, more translucent shades in the background, creating a sense of depth and atmospheric perspective. The peaks are jagged and irregular, mimicking natural mountain silhouettes.

AN APPALACHIAN CURRICULUM



The Appalachian Consortium was a non-profit educational organization composed of institutions and agencies located in Southern Appalachia. From 1973 to 2004, its members published pioneering works in Appalachian studies documenting the history and cultural heritage of the region. The Appalachian Consortium Press was the first publisher devoted solely to the region and many of the works it published remain seminal in the field to this day.

With funding from the Andrew W. Mellon Foundation and the National Endowment for the Humanities through the Humanities Open Book Program, Appalachian State University has published new paperback and open access digital editions of works from the Appalachian Consortium Press.

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An Appalachian Curriculum

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Welcome to "An Appalachian Curriculum"

An Appalachian Curriculum is the product of a week-long teachers' workshop held on the campus of Radford University in June, 1998. The purpose of the workshop was to allow children from the Southern Appalachian region to gain better educational access to the natural and cultural resources available on the Blue Ridge Parkway.

The project targeted fourth-grade teachers because they are in an advantageous position to influence children to be environmentally conscious and because the Virginia fourth grade curriculum focuses on the history of the Commonwealth. The activities presented here, however, can easily be adapted for any age group.

During the workshop, the teachers visited Blue Ridge Parkway sites at Humpback Rocks, James River, Peaks of Otter, Roanoke Mountain, and Mabry Mill. These are the most commonly visited sites in Virginia along the Parkway and are the closest to the communities where educational visits typically originate. At each site, the teachers were able to discuss the resources and the history of school group visitation with Parkway staff.

Throughout the summer and fall of 1998, the teachers developed educational activities that coincided with the Standards of Learning for Fourth Grade. These activities, and others written by Parkway staff, comprise the curriculum guide. This guide is a curriculum written by teachers for teachers.

The activities presented may be copied and used by any class or group who wishes to learn more about the resources of the Southern Appalachian region. The intent is that An Appalachian Curriculum will encourage other teachers to take advantage of these tremendous resources, and use them as living classrooms for their students.



ACKNOWLEDGMENTS

The activities in An Appalachian Curriculum were written by three teachers from the Appalachian Region of Virginia. They were chosen for their experience in teaching in the region and for their record of excellence in the classroom. The authors include:

Carolyn Pillis – Ms. Pillis has over twenty years of teaching experience and has taught fourth and fifth grade students at G.W. Carver Elementary School in Salem, Virginia for the past nine years. Carolyn has also taught school in South Carolina, Nebraska, and Hawaii. She received her Bachelors Degree from Radford College and a Masters of Education from The University of Virginia.

Donna Wright - Ms. Wright is a fourth grade teacher with thirteen years of experience at G.W. Carver Elementary School in Salem, Virginia. She received her Bachelors Degree from Radford College.

Diane Grant Thompson - Ms. Thompson is a fourth grade teacher at Oak Grove Elementary in Roanoke, Virginia and has more than twenty eight years of teaching experience. She received her Bachelors Degree and Masters Degree from Longwood College. Diane was named the 1995 Teacher of the Year for Roanoke County Schools and honored the same year as Teacher of the Year by the Salem – Roanoke County Chamber of Commerce. She has served as a consultant with MacMillan, Delmar, and Charlesbridge Publishers.

Project Directors:

Peter Givens is the Virginia Interpretive Specialist on the Blue Ridge Parkway and directs education, programming, and exhibits for the Virginia Districts. Patty Lockamy is the North Carolina Interpretive Specialist and has similar responsibilities for the North Carolina Districts of the Blue Ridge Parkway. They each bring to this project over twenty years of work in a variety of National Park and Environmental Education facilities.

Special Thanks to:

Emily Burleson of the Appalachian Consortium who served as administrative coordinator for the project, and to Dr. Grace Toney Edwards, Director of the Radford University Appalachian Studies Program to took the time and effort to share her knowledge of the region with the workshop participants.

Funding for An Appalachian Curriculum was provided by the National Park Service's "Parks As Classrooms" Grant Program.

BLUE RIDGE PARKWAY

The Blue Ridge Parkway is known today as perhaps the greatest scenic highway in the world. Indeed, it was designed to meet this expectation almost 65 years ago. It extends 469 miles along the crests of the Southern Appalachians and links two national parks – Shenandoah and Great Smoky Mountains. Along the way, it meanders through some of the most significant cultural and natural resources in North Carolina and Virginia. The Parkway provides seemingly endless but breathtaking views of parallel mountain ranges, scattered hills, and mountain farms.

Wildlife is abundant along the Parkway. Your students may be delighted to observe deer, bear, wild turkey, or bobcats. They may enjoy bird watching – like the hawk migrations in the spring and fall or the high elevation species such as the winter wren. Perhaps they will observe a groundhog as it sits erect along the roadside or enjoy a glimpse of a fox or opossum. They are sure to note signs of wildlife all around.

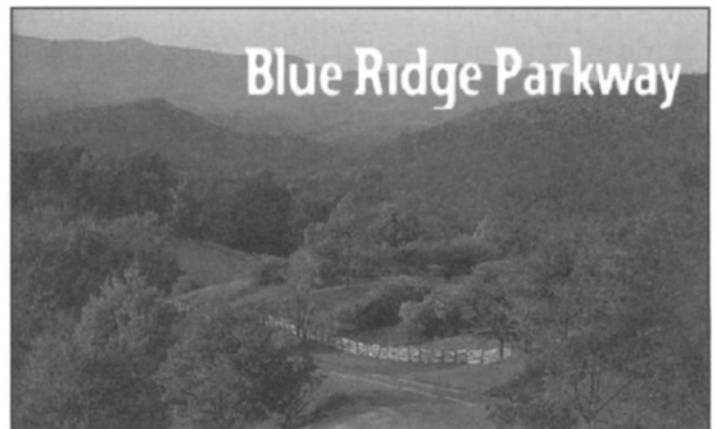
History is rich in this national park. The stories of independent mountain people are told at many overlooks along the way. There are log cabins, working farms, a mountain mansion and a grist mill. All walks of historical mountain life leave some type of tale to tell along the Parkway. In some areas, students may even observe authentic Appalachian handicraft in production.

Wherever you go along the Parkway, you will find resources to match your curriculum. Recreation areas, varying in size from several hundred to several thousand acres, are wilderness gems for those who enjoy the out-of-doors. Cultural resources are abundant. Most developed areas include picnic facilities, restrooms, water fountains

and hiking trails. The Parkway offers an ideal spot for a field trip for any age group.

Be sure to be prepared for cool weather and unexpected changes in the weather. As in many mountain areas, students will need good walking shoes, plenty of food and water, and a warm jacket.

The activities that follow reflect but a sample of what you can do along the Blue Ridge Parkway with your class. We hope that you will adapt all of the activities in this book to various Parkway sites – or perhaps create a few activities of your own. For further information about the Blue Ridge Parkway, call (828) 298 0398.



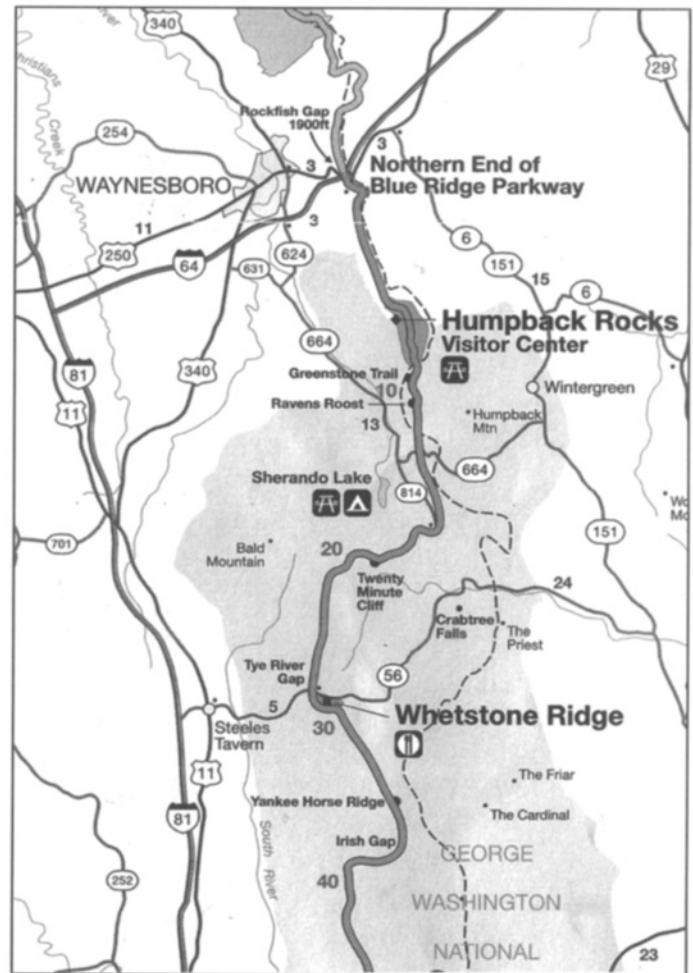
HUMPBACK ROCKS MILEPOST 5.8

Humpback Rocks is the northernmost developed area on the Blue Ridge Parkway, located at Milepost 5.8 near Waynesboro, Virginia. Here, visitors find a combination of cultural and natural history features common to the Blue Ridge.

A one-quarter mile trail from the visitor center connects a number of nineteenth century farm buildings, put together as a "museum" of Appalachian culture in the 1950s. Costumed interpreters are available from spring to fall, demonstrating life on a rural Blue Ridge farm. The remnants of a mid-nineteenth century turnpike follow along the Parkway as well. The exhibits in the Humpback Rocks Visitor Center help tell the story of life along the Blue Ridge from 1850 – 1950, and are designed to dispel many of the myths and stereotypes of Appalachian life.

The Appalachian Trail traverses the area and provides wonderful hiking opportunities. Hiking to the top of Humpback Rocks has been popular since before the establishment of the Parkway. Magnificent views to the west across the Shenandoah Valley and toward the Allegheny Mountains reward the hiker at the summit.

Humpback Rocks can be reached by following U.S. Route 250 or Interstate 64 to the Blue Ridge Parkway exit at Rockfish Gap. Follow the Parkway south to Milepost 5.8 and the visitor center parking lot.



LIVING ON A 19TH CENTURY BLUE RIDGE FARM

Goal

The student will learn how an 1890s farm in the Blue Ridge may have actually looked and how economics and self-sufficiency were a life style.

Strand

English - Reading/Literature
History and Social Science

Standards of Learning

English 4.4, 4.6
History & Social Science 4.5, 4.6

Background Information

Humpback Rocks is at Milepost 5.8 near Waynesboro. A visitor center and a reconstructed museum of mountain farm buildings are located at the site. The Visitor Center exhibits are designed to break down many of the stereotypes about the early settlement and life along the Blue Ridge and deal with housing, occupations, transportation, entertainment, and tourism in the Blue Ridge from 1850-1950. At the farm, visitors can walk in and around 19th century log buildings and see costumed interpreters demonstrating lifestyles, skills, and crafts.

Materials Needed

Notebook and pencil

Suggested Background Reading

Spencer's Mountain, Earl Palmer
Our Vanishing Landscape, Eric Sloane

PRE- SITE ACTIVITIES

Read a novel with a setting in the mountains. *Shiloh*, *Bridge to Terabithia*, or *When I Was Young in the Mountains* are suggestions. Students can discuss how life depicted in the book is different or similar to their own. Ask "How would the book change if the setting was different? How would the book change if dialect was not used?" Discuss what students think a typical farm would need to be self-sufficient in the 1890s. Use map skills to see what town Humpback Rocks is near. On a current map, show the railroad and highways crossing at nearby Rockfish Gap.

ON SITE ACTIVITY

Discuss with the students what surprises they encountered. How is the farm similar to what they expected? Discuss how common hand made items were compared to store-bought items. How did people get items they could not make or produce on their own? In what ways is the cabin similar to your own home? Write a paragraph or sketch a picture of the most unusual thing you have encountered on your visit.

POST SITE ACTIVITY

Discuss how rural life was changing with the coming of the railroad in the 1850s. Did living close to town benefit the occupants of this farm?

Write an acrostic poem about the farm. Write three things they knew about farming prior to their visit. Write two things they learned about farming based on their visit. Write one thing they want to research about farming.

LIFE THEN AND LIFE NOW

Goal

The student will demonstrate an understanding of advancements made in technology and industry in the twentieth century by preparing a chart comparing the farm museum to their own home.

From the chart, the student will write a paper comparing and contrasting their home with the farm museum at Humpback Rocks.

Strand

History and Social Science
English – Oral Language and
Reading/Literature

Standards of Learning

History and Social Science 4.6, 4.7
English 4.2, 4.7

Background Information

Humpback Rocks is at Milepost 5.8 near Waynesboro. A visitor center and a reconstructed museum of mountain farm buildings are located at the site. The Visitor Center exhibits are designed to break down many of the stereotypes about the early settlement and life along the Blue Ridge and deal with housing, occupations, transportation, entertainment, and tourism in the Blue Ridge from 1850-1950. At the farm, visitors can walk in and around 19th century log buildings and see costumed interpreters demonstrating lifestyles, skills, and crafts.

Materials Needed

Notebook and pencil

Suggested Background Reading

A Pioneer Sampler, Barbara Greenwood
Spencer's Mountain, Earl Palmer
Our Vanishing Landscape, Eric Sloane

PRE – VISIT ACTIVITIES

Students will make a list of the activities and chores they completed in their own homes prior to coming to school that day and carry the list to Humpback Rocks.

ON - SITE ACTIVITIES

Students will note how a family living on a farm such as this secured and prepared food, cleaned clothes and washed dishes, cooked, manufactured or bought fabric for clothes, kept and cared for livestock, received information from local towns and cities, and heated their homes. Students will chart how the activities they listed from their own home were completed on an 1890s Blue Ridge mountain farm.

POST- SITE ACTIVITIES

Students will identify five improvements or inventions that have made life easier and more efficient for Virginians since the 1890s.

After students have reviewed and shared the results of their chart of home activities and farm activities, they will use the chart as a guide to write a paper comparing their own life to the life depicted at Humpback Rocks.

MAPPING THE APPALACHIAN TRAIL

Goal

Students will use map-reading skills to map the Appalachian Trail and get a sense of its length and importance.

Strand

History and Social Science
Science – Resources

Standards of Learning

History and Social Science 4.2
Science 4.8

Background Information

The Appalachian Trail stretches 2,168 miles from Springer Mountain in Georgia to Mount Katahdin in Northern Maine. The trail is the longest continuously marked hiking trail in the world, stretching through 14 states. It is not an easy walk and was created for serious hikers who want a physical challenge while enjoying spectacular scenery. Students will need to research the Appalachian Mountains and trails.

Materials Needed

A map of the Eastern United States, a Commonwealth of Virginia map, a US Geological Survey map of the Sherando VA quadrangle, notebook and pencil.

Suggested Background Readings

Walking the Blue Ridge, Leonard Adkins.
The Height of Our Mountains, Branch and Philippon.
A Naturalist's Blue Ridge Parkway, Catlin.

PRE – VISIT ACTIVITIES

Locate two maps, one of the eastern United States and one of the Commonwealth of Virginia. Have students locate the Appalachian Trail, the Appalachian mountains, and Georgia and Maine.

ON – SITE ACTIVITIES

Have students mark Humpback Rocks on each map and identify one section of the Appalachian Trail on site and marking it on the map. Hike a portion of the trail, noting the time it takes and the distance covered. Also spend time identifying trees, wildflowers, or other natural features.

POST – SITE ACTIVITIES

Upon returning to the classroom, have the students determine how long it would take to hike the entire Appalachian Trail based on their time and distance recorded on – site.

Have the students plot the following points along the Appalachian Trail, noting the longitude and latitude of each:

Springer Mountain, Georgia

Peaks of Otter, Virginia

Humpback Rocks, Virginia

Southern New York State

White Mountains, New Hampshire

Mt. Katahdin, Maine

Discuss the importance of preserving the natural features of the areas along the Appalachian Trail for the benefit of all Americans.

TRAVELING IN THE MOUNTAINS

Goal

Students will identify a variety of transportation routes across the Blue Ridge and read historical accounts of Virginians traveling in the mountains in the 1800s.

Strand

History and Social Science
English – Research

Standards of Learning

History and Social Science 4.2, 4.5, 4.7
English 4.9

Background Information

Several transportation routes cross the mountains near Humpback Rocks and help document the history of this portion of the Blue Ridge. Remnants of the Howardsville Turnpike, a c.1840s route that connected the Shenandoah Valley with coastal markets, are visible in the area. In the 1850s, a railroad tunnel was completed under Rockfish Gap and became a strategically important route during the Civil War. U.S. Route 250, Interstate 64, and the Blue Ridge Parkway all represent transportation developments and helped connect portions of the mountains with other regions of the Commonwealth.

Materials Needed

A current Virginia Highway Map, a U.S. Geological Survey map (Shenando, Waynesboro East and/or West), a U.S. Geological Survey raised relief map (Charlottesville, VA), 1885 atlas of Augusta County by Hotchkiss. Colored markers or pencils.

Suggested Background Readings

The Great Wagon Road, Parke Rouse. *The Height of Our Mountains*, Branch and Philippon. *Westward Expansion*, Billington.

Pre – Visit Activities

Students will look at a variety of maps of Virginia and note land and water transportation routes, discussing the mountains and the barrier they formed to east-west transportation. The advantages of living on a transportation route, social and economic, will be discussed and the teacher will read portions of 1856 letter (perhaps in costume) describing life on the Howardsville Turnpike.

On – Site Activities

At Rockfish Valley, Afton, and Shenandoah Valley overlooks, busses will stop and teachers can point out the valleys and distant views of railroads and highways. At Humpback Rocks, students will divide into groups using different maps and locate historic and current transportation routes across the mountains. In *The Height of Our Mountains*, teachers can read selections from journals of people who traveled in the Blue Ridge, i.e. George Washington as a sixteen year old boy and William Byrd during the survey of the Virginia and North Carolina border.

Post – Site Activities

Students will create a map of Virginia and draw as many historic routes of transportation as they can identify and write a journal entry about some of the adventures possibly encountered on a trip in the 1800s.

TENDING THE FARM OR GOING TO TOWN

All that is Native and Fine: The Politics of Culture in An American Region, David Whisnant.

Goal

Students will see that, even in mountain communities, the industrial growth of nearby towns affected people's lives tremendously.

Strand

History and Social Science

Standards of Learning

History and Social Science 4.5

Background Information

At first glance, Humpback Rocks and the collection of restored 1890s buildings suggest to visitors that mountain families were always isolated and not connected with industrialized towns or the regional economy. A closer look, however, combined with a little research, demonstrates that there were roads connecting this area with Waynesboro and the canal traffic on the James River. People living in the mountains could work in the Mount Torrey Iron Furnace, or buy manufactured goods in nearby towns. The industrialization that swept the nation and the Commonwealth of Virginia in the latter nineteenth century also affected rural, mountainous communities.

Materials Needed

Atlas of Augusta County 1885, Hotchkiss, Current map of Virginia, notebook and pencil.

Suggested Background Readings

"Land and Family: An Historical View of Preindustrial Appalachia," Ron Eller.
Appalachia on My Mind, David Shapiro.
Miners, Millhands, and Mountaineers: The Industrialization of the Appalachian South, Ron Eller.

Pre-Visit Activities

Teacher discusses with students the effects of landscape on the lives of people who settled in Virginia. These could include the advantages or disadvantages of mountains, rivers, mountain gaps, and coastal regions related to economy, development of towns, and the sense of community that develops in an area.

As a class, create a list of all of the advantages and disadvantages of living in the Blue Ridge region. Allow children to create the list without any "right or wrong" answers so that the list can be used on-site to actually determine real advantages and disadvantages.

On – Site Activities

First by observation and then by using historic and current maps, determine where roads crossed the mountains and connected Humpback Rocks with local towns. Using advertisements from local newspapers, look at the items that were available in Waynesboro and the opportunities for employment that existed in logging, apple industry, iron works, railroads, and canals. From *A Pioneer Sampler* by Barbara Greenwood (1840s and somewhat pre-industrial, but with many good items), read about peddlers, local stores, gristmills, and schools that played an important role even in rural communities. Reference the advantages-disadvantages list that the students made.

Post – Visit Activities

Create another advantages-disadvantages list by reviewing and correcting the list made before the Parkway visit.

HUMPBACK ROCKS WORD SEARCH

The following words are ones that you may hear during your visit to this part of the Blue Ridge Parkway and are important to your understanding of the stories that took place here. In the word search, you may find the words forwards, backwards, vertically, or horizontally. Have fun!

Appalachian Trail
Howardsville
Blue Ridge
Shenandoah
Railroad
Valley
Isolation

Humpback
Turnpike
Rockfish Gap
Iron Ore
Augusta
Peddlers
Wildflowers

Cabin
Mountains
Waynesboro
Industry
Virginia
Apples

A	P	P	A	L	A	C	H	I	A	N	T	R	A	I	L	A	W	O	N
O	L	Y	P	A	I	U	U	N	O	S	T	E	U	R	O	N	O	K	A
T	E	N	E	O	N	O	M	A	P	P	A	H	G	O	M	P	B	A	P
O	R	N	D	L	I	A	P	E	S	T	Y	I	U	N	T	O	P	M	P
A	R	C	D	B	G	Y	B	R	O	T	S	C	S	O	T	Y	L	O	L
R	Y	N	L	O	R	E	A	L	A	C	T	O	T	R	P	E	Q	M	E
Z	R	O	E	V	I	T	C	A	B	I	N	L	A	E	M	L	S	O	S
E	T	E	R	R	V	O	K	P	S	T	M	N	L	T	N	L	R	R	A
O	S	T	S	A	M	H	U	M	T	R	E	H	O	R	O	A	E	S	L
H	U	M	P	R	O	R	N	L	A	L	S	A	T	E	I	V	W	A	L
L	D	O	A	E	R	S	T	N	L	P	Q	O	R	H	T	S	O	R	O
N	N	T	T	U	R	N	P	I	K	E	H	D	O	A	A	N	L	E	S
T	I	S	M	P	Q	R	V	I	L	S	L	N	E	H	L	I	F	D	O
O	A	E	L	S	O	S	T	R	I	N	T	A	E	L	O	A	D	A	T
A	M	D	L	O	D	R	U	F	H	U	H	N	O	W	S	T	L	O	D
L	M	N	O	R	I	K	K	O	R	N	S	E	A	B	I	N	I	R	T
E	N	T	A	O	C	C	E	P	L	A	N	H	B	L	R	U	W	L	E
E	N	W	P	O	O	S	W	A	Y	N	E	S	B	O	R	O	L	I	T
K	O	C	R	R	A	B	W	P	A	Y	K	H	M	U	P	M	A	A	R
H	M	O	F	B	L	U	E	R	I	D	G	E	N	O	A	O	R	R	I

Shortly after moving to Back Creek, on the western side of the mountains below Humpback Rocks, Jane Lewis wrote the following letter to her brother. It describes her move, her home, and provides insight into life here before the Civil War.

Sherando, Augusta Va November 22, 1856

My Dear Brother

You will doubtless be surprised at the caption of this communication. It is no less strange than true contrary to my expectations and interests we have changed our place of abode, and as it were pitched our tent in the wilderness, right at Back Creek, at the foot of Hump Back Mountain, I like it not. I feel sad and disheartened, We have a new house tho not a convenient one. It is badly laid off, room enough if properly arranged, Our furniture was very much injured in hauling. It was badly packed and my bureau is ruined and in truth all more damaged. My neighbors are kind. Some of them have been to see us. Ian Rankin came out with us. She is still with me. If it was not for her cheerful disposition my spirits would certainly flag. We came here the first of November. I received your kind letter a few days before we left, in consequence of our preparing to leave dear old Mt. Meridian, I was deterred from replying immediately as requested, as cruel fate forbade the decree that my journey through life should not be spent near my own loved ones. Mt. Meridian was to me a hallowed spot. I should have been content there to rest. Mr. Lewis thought otherwise, the interest of himself and family bade him depart and dwell at the foot of this lonely Mountain. I murmur not, though I am far from being satisfied. No school for my little ones. What will I do? The thought of separating them from me in tender infancy is really maddening. I try and banish the thought and clasp them closer to my breast. We are 4 miles from Adam McChesney, 7 from Tommy Johnston, 9 from Peggy Scotts, I hope often to visit them. Our residence is upon the Howardsville Turnpike so you see you will have Turnpike to our door. It suits his business friends... he will make money... that is not everything in this world. We see strange sights. Here you may see men on weekdays going to church up on a bag of grain to mill with his wife behind him. I could not but laugh, it reminds me so much of Phillippa. They are very religious. They pray fervently for all upon Back Creek. A great revival here now. They go to meetings every night. A moral, sober, industrious people such is their character. Methinks I can hear you think Jane ought to be satisfied. I know it. My stubborn heart still yearns to live and die in my dear native Rockbridge, yes sleep within her breast, blame me not, my own dear Brother. This is my fourth home since I left the Parental roof. Yet not one of them have been graced by your presence. How gladly would I welcome you, or any of you, come when you can. It is only 1 day ride and good roads. I feel anxious to hear from you. Let me hear immediately, I hope all may be in tolerable health. Ma, I feel uneasy about her. I hope we may meet again. It seems I am greatly tossed about, but still surrounded by many blessings. I possess many of the comforts of this life, how thankful, how very thankful I feel. All that distresses me is the sight of you all, so often has sickness and death invaded that beloved circle, and I forbade the sight that it sickens the heart and did I permit it to dwell constantly upon my mind. It would be more than I could bare. I still hope to end my days near you. God only knows whether or not I will be disappointed. All the friends on Middle River were well when I left. Maggie Johnston was married on the 23 of Oct, I was there a few days before we left. I am pleased with her husband, a Mr Melhorn, in my opinion he is a clever man. He is a consistent member of the Methodist Church, she danced the night of her wedding. I don't think he liked it much. I must close, the mail is waiting. It comes here twice a week Wednesday and Saturday. You will know how to write - the post office is in the store - direct to Sherando. Tell Ann I have moved and she owes me a letter. Come down Christmas, if you can, tell me all the news. I heard of Ezeuell's negro attempting to kill him... so much for abolition. Colonel Reid has lost his only son... what an affliction. Mr. Grey came up with the remains. I want to hear of all the changes. Our love to all in haste.

Thine truly,
Jane Lewis

write

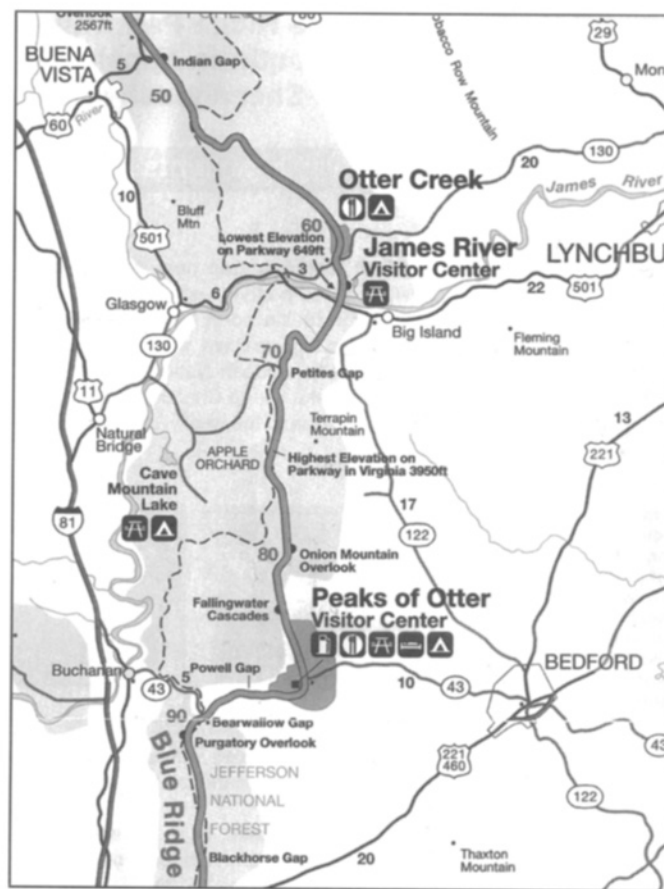
JAMES RIVER MILEPOST 63.8

The James River crosses under the Blue Ridge Parkway at this spot, providing a unique experience for visitors. Both from a natural and a cultural perspective, there is much information for visitors to learn.

The Parkway dips to 649' above sea level here, and the vegetation, climate and animal life are affected accordingly. A nature trail follows along Otter Creek and around Otter Lake. A short loop trail at the visitor center is an excellent spot for identification of local trees and provides great views of the river. Geologically, the area is significant as the James River creates a great "water gap" where it cuts through the mountains.

The James is perhaps the most historic waterway in the Commonwealth, figuring into the recorded history of Virginia at almost every major crossroads. A restored canal lock and exhibits in the visitor center record the efforts to establish the James River and Kanawha Canal, which made this river navigable from west of the Blue Ridge to Richmond.

The James River Visitor Center and picnic area are located at Milepost 63.8. Visitors can reach the site by following U.S. Route 501 from Lynchburg or Buena Vista to its intersection with the Parkway. Turn north on the Parkway and cross the James River to the visitor center.



TRANSPORTATION ACROSS THE OLD DOMINION

Goal

Students will trace the development of systems of transportation across the history of Virginia.

Strand

Science – Force, Motion, and Energy
History and Social Science

Standards of Learning

Science 4.2

History and Social Science 4.1, 4.2, 4.5, 4.7

Background Information

The Blue Ridge Parkway crosses the James River here and dips to its lowest elevation, 649' above sea level. There is a footbridge across the river and restored locks on the canal system that make this a memorable experience for visitors. The wayside exhibits and the displays in the visitor center tell the story of the construction and importance of the James River & Kanawha Canal system. Standing on the footbridge, visitors can also see the route of a US Highway, the CSX train tracks, and, obviously, the Blue Ridge Parkway. It is an excellent place to contemplate and study the development of numerous methods of transportation that parallel the history of the Commonwealth.

Materials Needed

Official State Transportation map. Notebook and pencil.

Suggested Background Reading

Waterway to the West, James Kirkwood.
The Great Wagon Road, Parker Rouse, Jr.

PRE SITE ACTIVITIES

Teacher and students should discuss various methods of transportation that have been used by Native Americans and European settlers in the history of the Commonwealth. "Game trails" (buffalo, deer, etc.), foot paths, wagon roads, stage coaches, rivers and canals, railroad, and recreational transportation should be identified and listed in a rough chronological order.

ON SITE ACTIVITIES

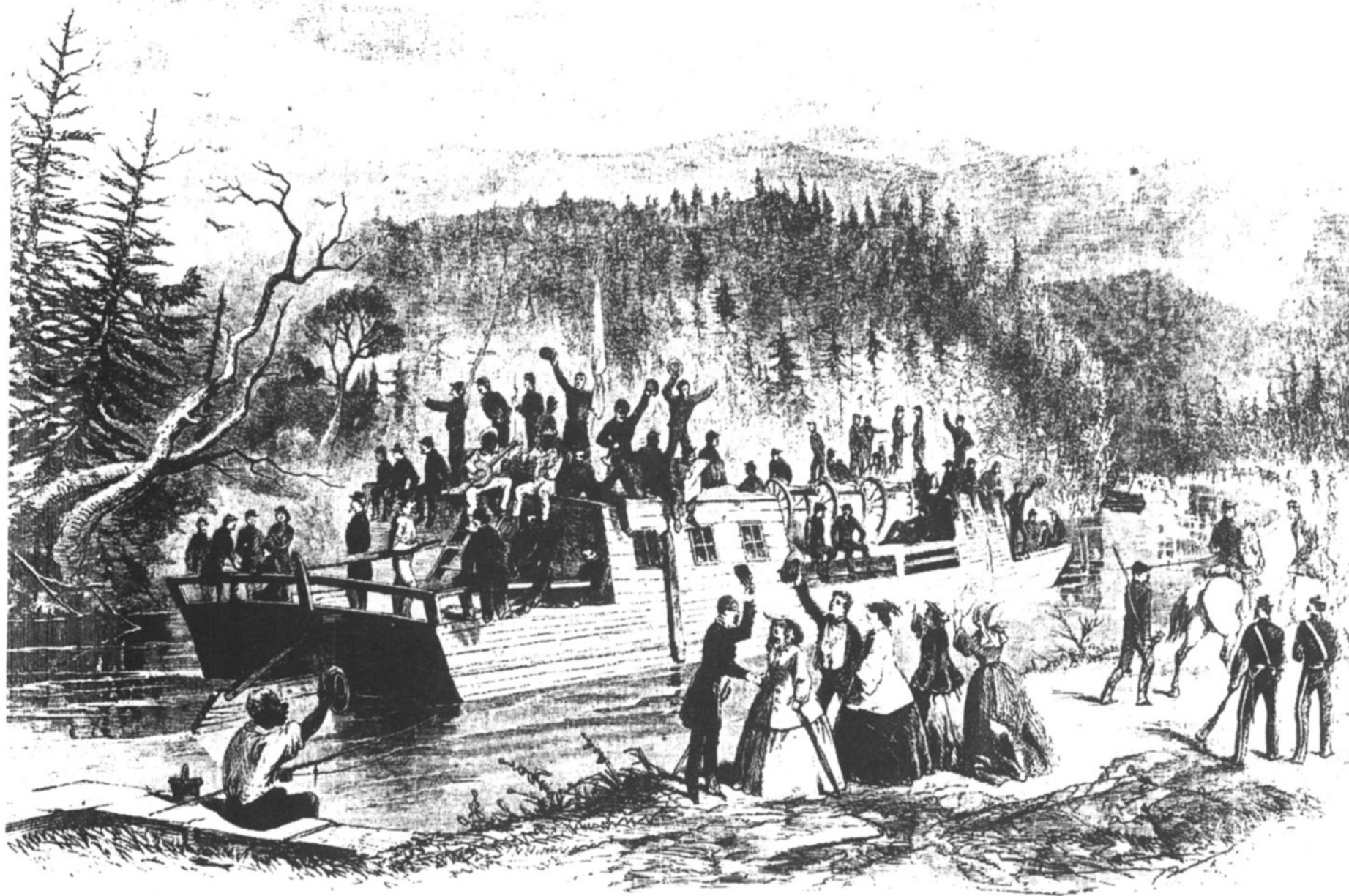
Students should read the displays in the visitor center and visit the restored canal locks. Teachers should then call attention to the fact that other transportation routes are also in view, allowing children to identify them and place them in order of development.

Teachers should distribute highway maps and allow children to mark interstates, rivers, scenic roads, and gaps where rivers and roads cross the Blue Ridge.

Note that good transportation routes and systems are essential to the development of cities and industries throughout the nation.

POST SITE ACTIVITIES

Have the children sketch people engaged in the various types of transportation that have been discussed and note that transportation from place to place is sometimes necessary, but in modern times, it can be purely recreational.



Confederate soldiers on the canal.

WATER QUALITY IN OTTER CREEK

Goal

Students will evaluate the water quality in a low-elevation stream and discuss how people living in Virginia use, modify and adapt to the physical environment.

Strand

Science – Living Systems, Resources

Standards of Learning

Science 4.5, 4.8

Background Information

The Parkway in this area winds along Otter Creek and Otter Lake for several miles, creating a good habitat for field study. The creek empties into the James River at the Visitor Center. The James figures prominently in the history of the Commonwealth of Virginia. The Parkway is at its lowest elevation (649' above sea level) where it crosses the James and, consequently, the vegetation and animal life in this area is very different than most parts of the Blue Ridge

Materials Needed

An aquatic field guide, pH kit, thermometer, magnifying glass, collection jars, chart or notebook for recording data.

Suggested Background Reading

A Naturalist's Blue Ridge Parkway, David Catlin. *The Height of Our Mountains*, Branch and Philippon.

PRE - SITE ACTIVITIES

Discuss with students the following indicators of good water quality: appearance, pH, smell, temperature, number and variety of species living in the water.

ON – SITE ACTIVITIES

Students will collect data and prepare a chart comparing water quality in Otter Creek with water quality at another site near their school. Students will make predictions before collecting data and make conclusions about the research.

Discussion questions may include:

1. Is this water source a watershed?
2. What can we conclude about the number of living species in this water source?
3. How does the pH level compare at each of the collection sites?

POST – SITE ACTIVITIES

Students and teacher will compare the data at the collection sites and discuss why the water quality tends to be superior in mountain streams. The discussion should be directed toward the following conclusions:

1. The nearer the source, the better the water quality should be.
2. Protected land with a good variety of trees and other vegetation acts as a filter, keeping silt out of streams.
3. Trees and other vegetation provide shade and cool temperatures.
4. Less construction in protected lands means less runoff of silt and dirt.

The discussion should emphasize the need for carefully planned development that protects the water resources in major watersheds.

TRAVELING ALONG THE JAMES RIVER

Goal

The student will learn how geographic location influenced settlers' lives

Strand

History and Social Science
English – Oral Language, Writing

Standards of Learning

History and Social Science 4.1, 4.2
English 4.1, 4.7

Background Information

The James River figures prominently in the history of the Commonwealth of Virginia. The tremendous water gap created where the James cuts through the Blue Ridge tells an important geological story as well. The Parkway is at its lowest elevation (649' above sea level) where it crosses the James and, consequently, the vegetation in this area is very different than most parts of the Blue Ridge. There is a footbridge across the river and restored locks on the canal system that make this a memorable experience for visitors.

Materials Needed

Commonwealth of Virginia Highway Maps for each group of students. Colored markers.

Suggested Background Reading

Waterway to the West, James J. Kirkwood.

Pre – Visit Activities

Discuss with students the geography of Virginia, emphasizing each region's unique features. Discuss how transportation routes affected peoples' lives. Share information from *Waterway to the West* and explain how changes in land forced the use of locks.

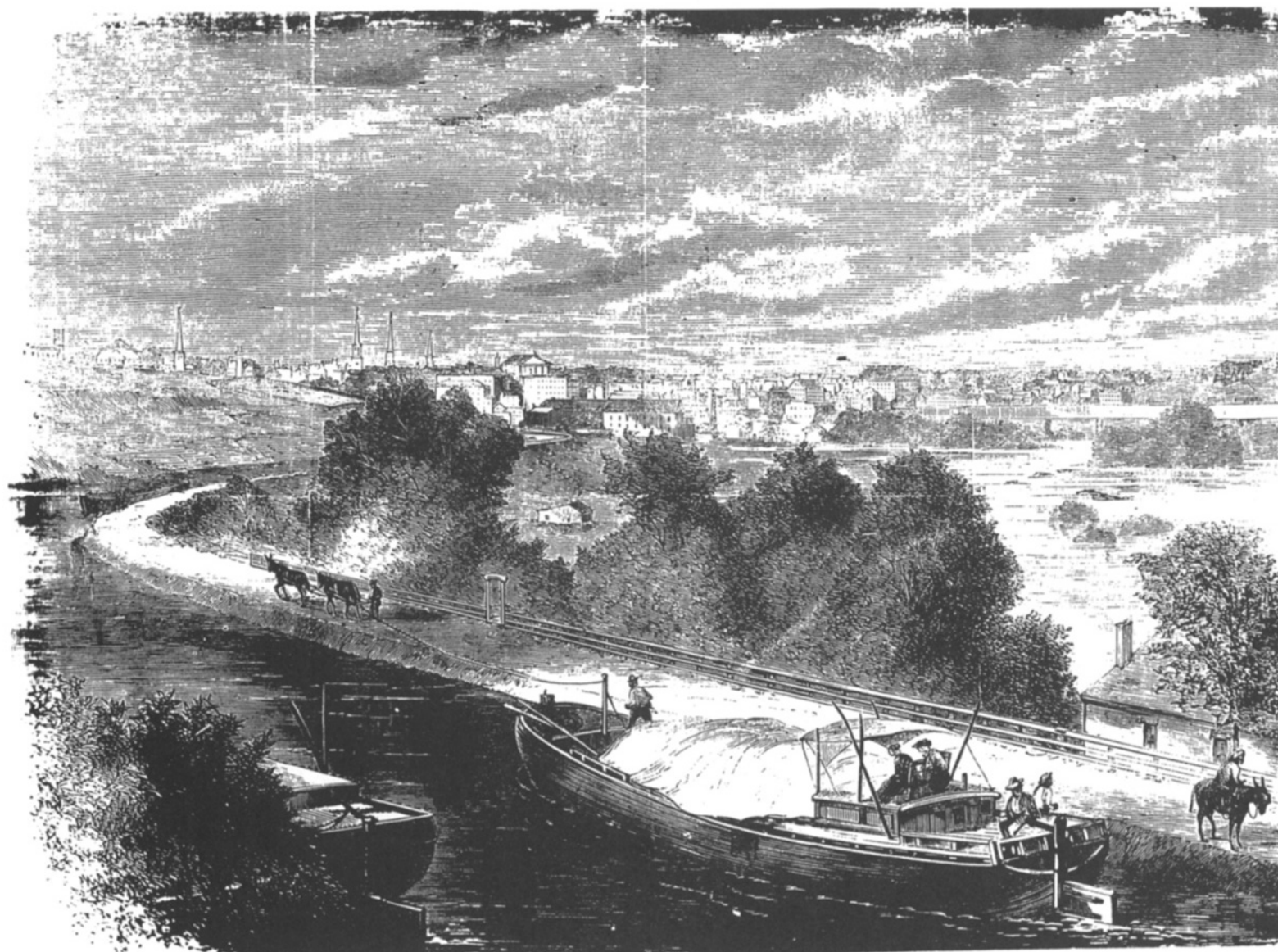
On – Site Activities

Divide the students into small groups, each one with a map of Virginia. Mark the route of the James from its headwaters to Richmond. The children should note the various regions of the state and the obvious passes through the mountains where the rivers cross. Point out to the children that a trip by canal from Lynchburg to Richmond took seven days.

Post – Site Activity

Pretend to be a farmer taking tobacco from Lynchburg to Richmond in 1840 when the canal was first completed. Write a journal of what the students think it would have been like to travel the canal. Be sure and include animals and trees seen along the river. Have a journal for each day of travel. Discuss how in 1890 the train came through the area causing canal travel to be less useful.

Why do the students think railroads were better for moving people and crops?



The James River Canal above Richmond

ANIMALS AROUND OTTER CREEK AND JAMES RIVER

Goal

Students will demonstrate through their writings and drawing how various animals interact with each other in an ecosystem.

Strand

Science – Living Systems

Standards of Learning

Science 4.5

Background Information

The James River figures prominently in the history of the Commonwealth of Virginia. The tremendous water gap created where the James cuts through the Blue Ridge tells an important geological story as well. The Parkway is at its lowest elevation (649' above sea level) where it crosses the James and, consequently, the vegetation and animal life in this area is very different than most parts of the Blue Ridge. The Parkway winds along Otter Creek and Otter Lake for several miles, creating a good habitat for field study.

Materials Needed

Notebook and pencil, field guide to animals, charts of animals

Suggested Background Reading

A Naturalist's Blue Ridge Parkway, David Catlin. A good, standard field guide to the Eastern United States.

PRE SITE ACTIVITIES

Give students a list of animals that they could expect to see or expect to see evidence of at the site. Have as many pictures of the animals available to the students as possible.

ON SITE ACTIVITIES

Students will hike all or part of the Otter Creek trail and mark the checklist when they see animals or evidence of animals. Students should take notes on the location of animals and describe the habitat.

POST SITE ACTIVITIES

1. Allow the students ample time to discuss all animal sightings.
2. Have students locate pictures of animals they saw in the field guides or in other reference materials.
3. Discuss the habitat of the various animals. What part of the habitat do these animals have in common? Could these animals survive and thrive in a different environment? Why or why not?
4. Students will draw the animals they saw and write at least three facts about the animals and its habitat. Put the illustrations and information in a book and pick an appropriate title.

PRESIDENTIAL IMPRESSIONS OF VIRGINIA

Goal

Students will study a natural area along the Parkway, read historical accounts by US Presidents on the natural history of the Commonwealth, and write a journal entry of their observations.

Strand

Science – Resources, Living Systems
English – Writing
History and Social Science

Standards of Learning

Science 4.5, 4.8
English 4.7, 4.8
History 4.7

Background Information

The James River figures prominently in the history of the Commonwealth of Virginia. The Parkway is at its lowest elevation (649' above sea level) where it crosses the James and, consequently, the vegetation and animal life in this area is very different than most parts of the Blue Ridge. The Parkway winds along Otter Creek and Otter Lake for several miles, creating a good habitat for field study. The "Trail of Trees" at the James River Visitor Center, or the "Otter Creek Trail" offer opportunities to identify animals and plants in the area. Numerous historical accounts, written by US Presidents, tell of the importance of the natural features of the Blue Ridge, and can be used to convey a strong environmental protection message.

Materials Needed

Notebook and pencil. One copy for the teacher of *The Height of Our Mountains*, Branch and Philippon.

Suggested Background Reading

A Naturalist's Blue Ridge Parkway, David Catlin. *The Height of Our Mountains*, Branch and Philippon.

PRE SITE ACTIVITIES

In the course of study on plants and animals, spend time with students discussing the abundance of natural resources in the Commonwealth. Discuss the variations in elevation and topography that affect the growth of various kinds of vegetation and the presence of various kinds of animals. Emphasize the importance of responsible protection of our natural resources.

ON SITE ACTIVITIES

Hike the Trail of Trees or the Otter Creek Trail and identify species of trees or signs of animal life. Discuss the elevation and geographic location of this area, the presence of the James River, and the geological "water gap" that the river cuts through the Blue Ridge.

Sit down with the students at the end of the hike and read selections from *The Height of Our Mountains* by George Washington, James Madison, Thomas Jefferson, Theodore Roosevelt, Herbert Hoover, and/or Franklin Roosevelt that emphasize the natural resources of Virginia.

POST SITE ACTIVITIES

Have students make a journal entry and a sketch of the natural features they observed on the trip. Have them write the entry as if corresponding with someone from another region or country who had never been to Virginia. Remind students that Thomas Jefferson wrote his first draft of *Notes of the State of Virginia* in response to questions posed by a friend from France.



George Washington as a young surveyor

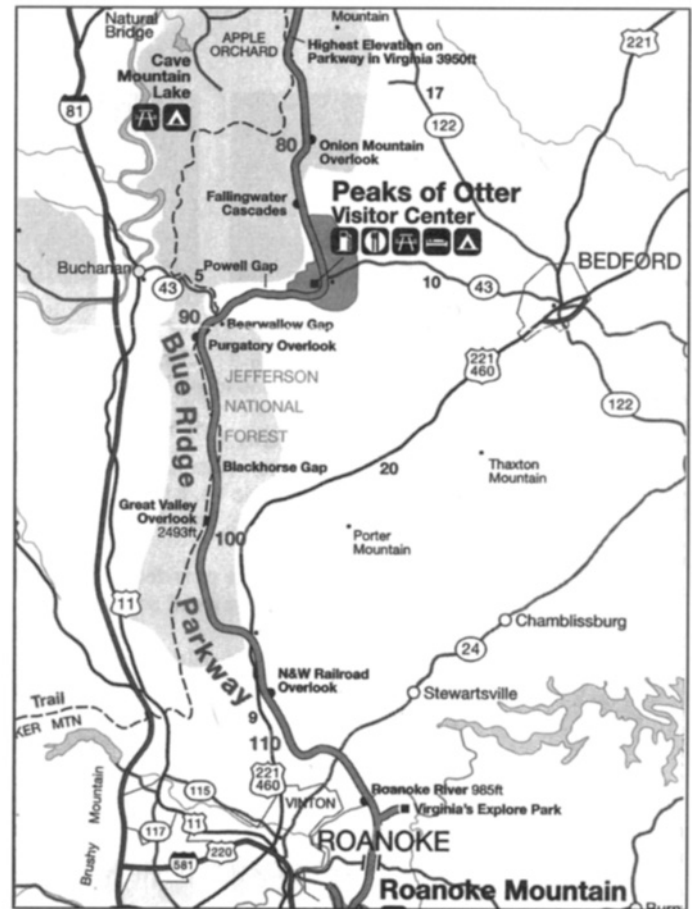
PEAKS OF OTTER MILEPOST 86

The Peaks of Otter, at Milepost 86 near Bedford, has been a well-known, popular tourist destination for centuries. Sharp Top, Flat Top, and Harkening Hill collectively make up the Peaks of Otter and have been photographed, studied and visited by some of Virginia's most famous residents, including Thomas Jefferson and Robert E. Lee.

The history of tourism and its economic effect on the residents of this community can be described here in detail. In addition, there are a number of nature trails that allow visitors to explore the rich natural history of the area. The Peaks of Otter is home to some rare and endangered species of plants and animals. The streams offer a rich look at aquatic life in a mountain watershed.

The Appalachian Trail traverses the area and provides great hiking opportunities. The adjacent Jefferson National Forest provides an expansive outdoor area for study and recreation.

The Peaks of Otter visitor center is at Milepost 86. From Bedford or Buchanan, take Virginia Route 43 – a steep and winding accent – to the Parkway. From Roanoke, follow the Blue Ridge Parkway north for approximately twenty miles.



CHANGING TIMES AT THE JOHNSON FARM

Goal

Students will demonstrate an understanding of the transition in Virginia from an agricultural to a more industrialized society through the writing of journal entries.

Strand

History and Social Science
English – Reading/Literature

Standards of Learning

History and Social Science 4.5, 4.6, 4.7
English 4.4

Background Information

Sharp Top, Flat Top, and Harkening Hill are the three individual mountains that are known collectively as the Peaks of Otter. This has been a landmark and a destination site for travelers in Virginia's Blue Ridge for hundreds of years. Robert E. Lee and Thomas Jefferson are among the notable Americans to visit or write about this area. The community that once surrounded a series of inns and hotels is now represented by the Johnson Farm, dating to the 1920s and 1930s. Unlike many Parkway structures, the main log house is covered with whitewashed siding, representing a change that took place in many mountain communities during the early 1900s.

Materials Needed

Notebook and pencil for each student

Suggested Background Reading

The Peaks of Otter Life and Times, Peter Viemeister.

Pre – Visit Activities

A visit to the Johnson Farm would correspond best with a study of Virginia's history in the 1920s and the economic and social transition of the Commonwealth from agricultural to urban and industrialized.

On – Site Activities

1. At the farm, students will record as many observations as they can about what they think it was like living here in the 1930s. Students should record how the family cooked, cleaned, bathed, obtained food, and slept.
2. Students should sketch the layout of the farm and outbuildings as well as the objects and major furniture inside the house.
3. Students will try to decide how the family obtained goods and services such as mail, electricity, and medical care.
4. Students will find out from the interpreter how this family interacted with tourists and visitors to the hotel at the base of Sharp Top.

Post – Site Activities

As a class, discuss notes and observations about the Johnson Farm. Based on these observations, have students write a detailed journal entry about a typical (or not-so-typical) day in the life of a family living at the Johnson Farm in the 1930s. Students should include knowledge of how goods and services were obtained. Allow students to illustrate their work as well.

PLANT TRANSPIRATION

Goal

Students will develop an understanding of the process of transpiration by demonstrating the process and calculating how much water a plant will give off in a day.

Strand

Mathematics – Computation and Estimation, Measurement

Science – Scientific Investigation, Reasoning, and Logic; Life Processes

Standards of Learning

Mathematics 4.6, 4.13

Science 4.1, 4.4

Background Information

Sharp Top, Flat Top, and Harkening Hill are the three individual mountains that are known collectively as the Peaks of Otter.

This has been a landmark and a destination site for travelers in Virginia's Blue Ridge for hundreds of years. In addition to the cultural stories of tourism and the travelling public in the Blue Ridge, the Peaks of Otter is a grand natural resource as well. The Elk Run Nature Trail begins at the visitor center and circles .8 miles. There are markers that identify tree species and the relationships existing between plants and animals in the forest.

Materials Needed

Pencils, notebooks, small plastic "baggies" and rubber bands for each group of three students.

Suggested Background Reading

A Naturalist's Blue Ridge Parkway, David Catlin. Any standard field guide to the Appalachian region.

PRE – SITE ACTIVITIES

Explain that plants have a cooling effect on our environment due to "air conditioning" created by evaporation of water through the surface of the leaves. This process is called transpiration. Large quantities of water are released into the atmosphere through this process.

ON – SITE ACTIVITIES

As students begin their hike, select several leaves on different species of trees. Place a baggie over the leaves and close them tightly with rubber bands. Record the time and proceed on the hike.

When group has returned to the beginning, note the time, describe the condition of the bag, then answer the following questions:

How long were you gone? How much water was collected (measure if possible)? Where did the water come from? Which species of tree produced the most water? If possible, determine the rate of transpiration by using the time and amount of water to determine a ratio.

POST – SITE ACTIVITIES

In the classroom, have the students draw the water cycle. Discuss how dependent our population is on water.

WATER QUALITY IN THE BLUE RIDGE

Goal

Students will evaluate the water quality in a major watershed and discuss how people living in Virginia use, modify and adapt to the physical environment.

Strand

Science – Living Systems, Resources

Standards of Learning

Science 4.5, 4.8

Background Information

Sharp Top, Flat Top, and Harkening Hill are the three individual mountains that are known collectively as the Peaks of Otter. This has been a landmark and a destination site for travelers in Virginia's Blue Ridge for hundreds of years. In addition to the cultural stories of tourism and the travelling public in the Blue Ridge, the Peaks of Otter is a grand natural resource as well. Winding through the picnic area is Little Stoney Creek, a good example of a "headwater" stream with a variety of aquatic species and easy accessibility for field study.

Materials Needed

An aquatic field guide, pH kit, thermometer, magnifying glass, collection jars, chart or notebook for recording data.

Suggested Background Reading

A Naturalist's Blue Ridge Parkway, David Catlin. *The Height of Our Mountains*, Branch and Philippon.

PRE - SITE ACTIVITIES

Discuss with students the following indicators of good water quality: appearance, pH, smell, temperature, number and variety of species living in the water.

ON – SITE ACTIVITIES

Students will collect data and prepare a chart comparing water quality in the Peaks of Otter area with water quality at another site near their school. Students will make predictions before collecting data and make conclusions about the research.

Discussion questions may include:

1. Is this water source a watershed?
2. What can we conclude about the number of living species in this water source?
3. How does the pH level compare at each of the collection sites?

POST – SITE ACTIVITIES

Students and teacher will compare the data at the collection sites and discuss why the water quality tends to be superior in mountain streams. The discussion should be directed toward the following conclusions:

1. The nearer the source, the better the water quality should be.
2. Protected land with a good variety of trees and other vegetation acts as a filter, keeping silt out of streams.
3. Trees and other vegetation provide shade and cool temperatures.
4. Less construction in protected lands means less runoff of silt and dirt.

The discussion should emphasize the need for carefully planned development that protects the water resources in major watersheds.

ELEVATION AND CHANGE

Goal

Students will collect, organize and display data to show the relationships of elevation to plant life and human use.

Strand

Science – Resources, Interrelationship in Earth/Space Systems
History and Social Science

Standards of Learning

Science 4.6, 4.8
History and Social Science 4.2

Background Information

Sharp Top, Flat Top, and Harkening Hill are the three individual mountains that are known collectively as the Peaks of Otter. This has been a landmark and a destination site for travelers in Virginia's Blue Ridge for hundreds of years. As visitors climb up to the Parkway from surrounding communities, they will notice a number of variations in temperature, vegetation type, and human use of the landscape. South of the Peaks of Otter near Roanoke, the Parkway travels on a thin ridge line that opens up vistas eastward toward the Piedmont and westward across the Shenandoah Valley and to the Alleghenies.

Materials Needed

Notebooks and pencils, binoculars, topographic map that includes elevations.

Suggested Background Readings

A Naturalist's Blue Ridge Parkway, David Catlin. *The Height of Our Mountains*, Branch and Philippon.

PRE VISIT ACTIVITIES

Discuss the basic geology of the Blue Ridge and the features that make them unique. Discuss in general terms the composition of the forest and the difference that elevation makes in vegetation and in human use of the forest and mountain resources.

ON SITE ACTIVITIES

Find the elevation of five or six mountains in the region, including those that make up the Peaks of Otter. Also note the height of Mt. Rogers, Virginia's highest peak. List them on a chart and rank them from highest to lowest.

Mountains and forests have a unique relationship. Certain trees grow best at certain elevations. Sketch an outline of a mountain and label the following elevations:

Above 5500	Spruce/Fir
3500-5500	Northern Hardwood Forests (Beech, Sugar Maple, Yellow Birch, Eastern Hemlock.)
1500-4500	Cove Hardwood (Deciduous) Forests
Below	Oak-Hickory Forests (Blick Oak, White Oak, Red Oak)

POST SITE ACTIVITIES

1. Study topographical maps and elevation markers.
2. Have the students make an elevation map of one of the mountains at the Peaks of Otter.
3. Find out how topographers determine elevation today.
4. From *The Height of Our Mountains*, read one historical account of the Blue Ridge.

DISGUISE A CADDISFLY

Goal

The student will find caddisfly cases in the stream and construct a model in the classroom.

Strand

Science – Living Systems

Standards of Learning

Science 4.5

Background Information

Sharp Top, Flat Top, and Harkening Hill are the three individual mountains that are known collectively as the Peaks of Otter. This has been a landmark and a destination site for travelers in Virginia's Blue Ridge for hundreds of years. In addition to the cultural stories of tourism and the travelling public in the Blue Ridge, the Peaks of Otter is a grand natural resource as well. Winding through the picnic area is Little Stony Creek, a good example of a "headwater" stream with a variety of aquatic species and easy accessibility for field study.

Materials Needed

In the field: An aquatic field guide, pH kit, thermometer, magnifying glass, collection jars, chart or notebook for recording data.

In the classroom: Thin cardboard tube, tape, glue, clay, leaves, twigs, small rocks.

Suggested Background Reading

A Naturalist's Blue Ridge Parkway, David Catlin. *Audubon Pocket Guides* and *Peterson First Guides* (Insects, Fishes, and Amphibians.)

PRE SITE ACTIVITIES

Discuss with students the basics of life forms in a clear mountain stream. Include information on the caddisfly as follows:

The caddisfly is an insect that spends much of its yearlong life underwater. When caddisflies are found in streams, it is a good indication the water is of good quality. Other insects that are "good water" indicators are the mayfly and the stonefly. Trout and other fish love to eat the caddisfly so to protect itself, the larva builds a camouflaged case around its body.

ON SITE ACTIVITIES

Students will collect data on temperature and pH, and determine the water quality in Little Stony Creek. Students will make predictions before collecting data and make conclusions about the research. Students will find a caddisfly case and make notes and observations necessary to construct a model in the classroom.

POST SITE ACTIVITIES

Make a caddisfly case, using a thin cardboard tube. Close the tube at one end with tape. Cover the entire tube with glue. Cover the tube with natural materials such as leaves, twigs, and small rocks. Use materials that will camouflage the tube.

Make the caddisfly larva using modeling clay and put the larva inside the tube.

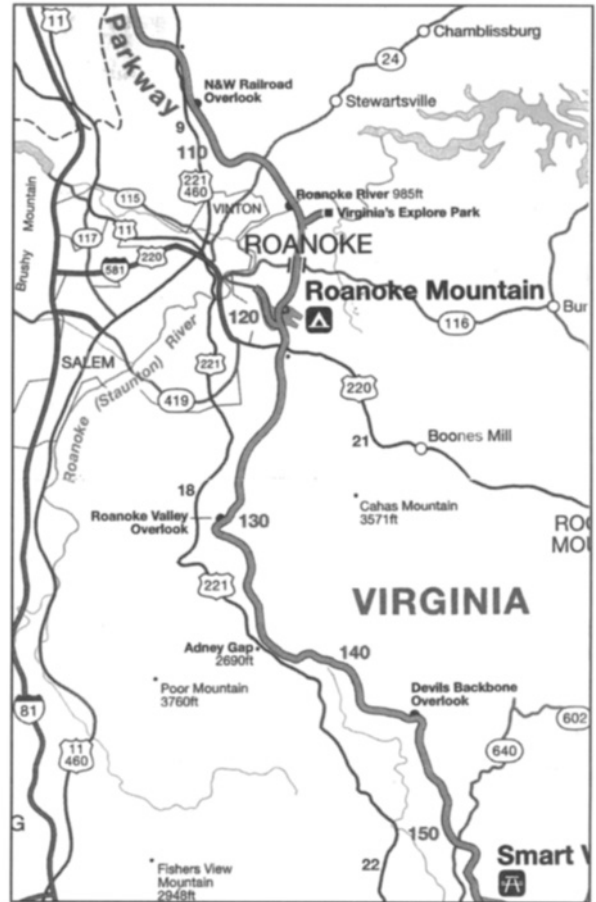
ROANOKE MOUNTAIN MILEPOST 120.4

Roanoke is the largest metropolitan area along the 469 miles of the Blue Ridge Parkway. For those who live, work, and go to school in an urban setting, the park is a welcomed natural corridor across the Roanoke Valley.

Roanoke is a city that grew out of the industrial revolution and the coming of the Norfolk and Western Railroad in the late nineteenth century. Remnants of iron ore mines are in the area and the change in Virginia from agricultural to industrial is a logical point of discussion and programs.

With no visitor center or covered facilities in the area, the Roanoke Mountain Campground serves as the gathering place for any school group visiting the Parkway. There are trails around the campground, open spaces, forested areas, and abundant examples of Blue Ridge flora and fauna. There is also a unique opportunity here to experience the "interface" between natural and urban lands and the concept of nature in your "back yard."

The Parkway is accessed in Roanoke at US 460, US 220, VA Rt 24, or Walnut Avenue. The Roanoke Mountain Campground is located on the spur road off of the Parkway to Mill Mountain Star, at Milepost 120.4.



DISTANCE AND ELEVATION

Goal

The students will calculate and measure distances between various places on the Parkway and compare various elevations in the area.

Strand

Social Studies

Math – Computation and Estimation

Standards of Learning

Social Studies 4.2

Math 4.6

Background Information

Roanoke Mountain Campground is a wonderfully wooded and natural area just minutes from the city, so there is a great opportunity for short trips that will take students into another environment. There are hiking trails through the campground and a variety of woodland flora and fauna that may be seen. Probably more than any other developed area, a visit here demonstrates the connection between urban and rural, between the Parkway and its neighboring communities, and the importance of protecting natural areas and green space. This campground is the only suitable gathering place for large groups in the Roanoke Valley area of the Blue Ridge Parkway. There are no covered facilities.

Materials Needed

Notebooks, pencils and rulers for each student. Parkway brochure. US Geological Survey Map of Roanoke or Virginia Highway map.

Suggested Background Reading

A Naturalist's Blue Ridge Parkway, David Catlin.

Pre Site Activities

Looking at the Parkway map, US Geological Survey Map, and the Virginia Highway map, students should locate prominent mountains, National Forests, major rivers, and the Parkway. Have the students estimate the distance from their school to Roanoke Mountain Campground.

On Site Activities

In addition to other activities associate with the field trip such as tree identification or nature hikes, students will estimate the approximate length of the Parkway, the distance from Roanoke Mountain to Explore Park, and the distance from Roanoke Mountain to Mabry Mill.

Have students identify the highest mountains shown on their maps and determine the difference in the elevation at the various locations. Discuss how the changes in terrain and elevation can affect the flora and fauna in an area.

Post Site Activities

Have the students chart or graph the differences in mileage and elevation that they determined on site.

Using the Parkway map, have the students make a graph with elevations marked vertically (from 500 to 6000 feet and at 500 foot intervals) and mileposts marked horizontally (from 0 to 469 miles and at 50 mile intervals). Note the NC/VA border at Milepost 216, which state has the highest mountains, rivers crossing at the lowest points, and the rapid change in elevation in some of the Virginia sections.

Elevation										
6000 feet										
5500 feet										
5000 feet										
4500 feet										
4000 feet										
3500 feet										
3000 feet										
2500 feet										
2000 feet										
1500 feet										
1000 feet										
500 feet										
Milepost	0	50	100	150	200	250	300	350	400	450

Using the Blue Ridge Parkway brochure, mark elevations (vertically on the left) by approximate milepost (horizontally across the bottom) for Rockfish Gap, White's Gap Overlook, the James River, Apple Orchard (the highest Virginia elevation on the Parkway), Great Valley Overlook, Roanoke River, Adney Gap, Rocky Knob, Groundhog Mountain, Piper's Gap, Air Bellows Gap, Jumpinoff Rock, Beacon Heights, Buck Creek Gap, Green Knob, Beetree Gap, Graveyard Fields, Richland Balsam (the highest point on the Parkway), and Oconaluftee (the southern end of the Parkway)

Based on your graph of Parkway elevations, consider the following questions.

1. Find the North Carolina/Virginia state line, mark it on the map, and decide which of the two states has, generally, the highest mountain ranges.
2. Looking at the map, decide what the two lowest points you graphed have in common.
3. Do you think it was more difficult to build the Parkway in North Carolina or Virginia?
4. Why do you think there are 26 tunnels on the Parkway in North Carolina and only 1 in Virginia?

WILDFLOWERS IN BLOOM

Goal

Students will identify species of wildflowers, noting their varying characteristics and applying their knowledge to plant anatomy.

Strand

Science – Life Processes, Living Systems, Resources

Standards of Learning

Science 4.4, 4.5, 4.8

Background Information

Roanoke Mountain Campground is a wonderfully wooded and natural area just minutes from the city, so there is a great opportunity for short trips that will take students into another environment. There are hiking trails through the campground and a variety of woodland flora and fauna that may be seen. Probably more than any other developed area, a visit here demonstrates the connection between urban and rural, between the Parkway and its neighboring communities, and the importance of protecting natural areas and green space. This campground is the only suitable gathering place for large groups in the Roanoke Valley area of the Blue Ridge Parkway. There are no covered facilities.

Materials Needed

A map of the Roanoke Valley showing the campground and its close proximity to the city. Any good field guide to flora of the Blue Ridge. A Parkway "Bloom Calendar."

Suggested Background Readings

A Naturalist's Blue Ridge Parkway, David Catlin.

Pre Site Activities

A field trip to Roanoke Mountain should be coordinated with the general science study of plants, resources, and living systems. The anatomy of plants should be covered prior to visiting the park. With a standard field guide and a Parkway "Bloom Calendar," have students identify the wildflowers and or blooming trees and bushes they are likely to find during their field trip.

On Site Activities

Students will identify wildflowers while walking the trails at the campground. They will focus on wildflowers pictured on the Blue Ridge Parkway brochure, or the ones they identified prior to their visit. Students should record the name of the flower in their notebook, a brief description, and a quick sketch.

Post Site Activities

Students will take time to re-draw and color their field sketches, using field guides and other photographs. They should identify and label the leaves, stem, roots, flower, stamen, pistil, and seed.

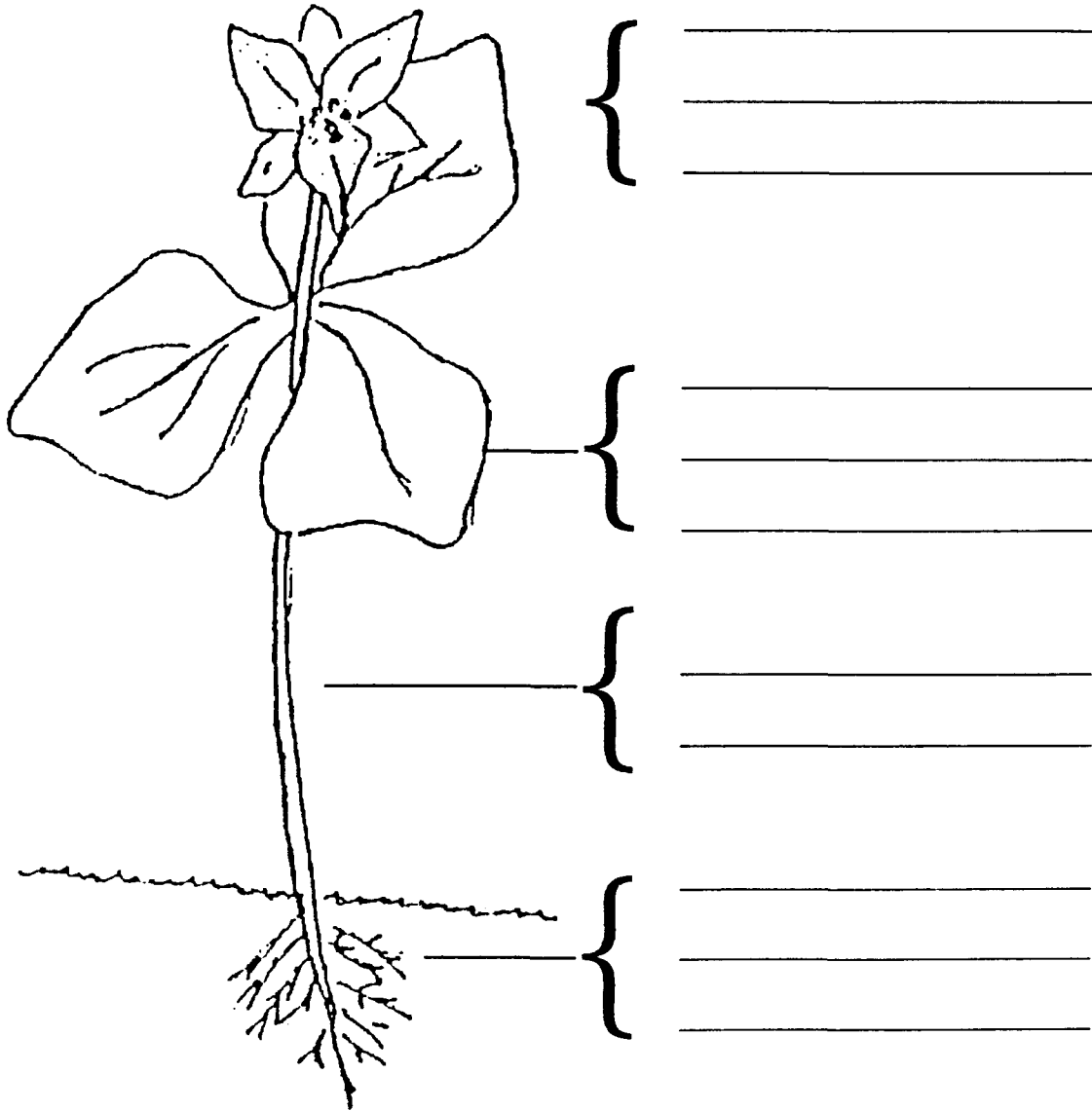
Demonstrate any of the following in the classroom:

Tie a clear, plastic bag onto a plant stem and watch the transpiration of water that is evident over a period of time.

Coat the upper side of four leaves and the under side of four leaves on a plant with petroleum jelly. The leaves coated on the underside where the stomata allows air and moisture to escape will die and the ones coated on the upper side remain unchanged.

Lean a potted plant at a 45 degree angle against a stack of books and watch the stems and leaves turn upward during the course of its growth.

Anatomy of wild flowers

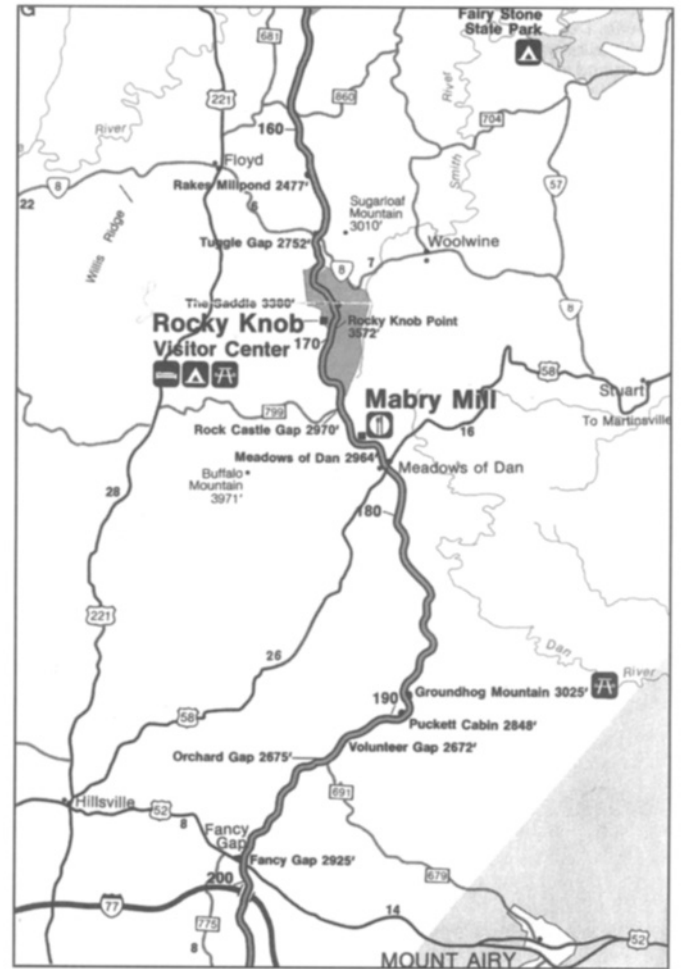


MABRY MILL MILEPOST 176

Mabry Mill is perhaps the most photographed spot on the Blue Ridge Parkway. Once-common water-powered grist mills are becoming more rare across rural America, and the picturesque nature of Ed Mabry's mill fascinates current visitors as much as it did the original Parkway planners.

A short trail in and around the mill area contains buildings and exhibits on other mountain "industries" such as blacksmithing and sorghum making. During the visitation season, costumed interpreters are demonstrating skills and crafts common to early 20th century rural communities. The concept of mountain communities is a good story to tell here, since the Mabry's mill, blacksmith shop, and sawmill served as a central gathering place in the Meadows of Dan area. The industrialization of Appalachia and the migration of workers from rural to urban areas was part of the reason for the demise of the mill in the 1930s. Obviously, this is an important concept to convey to school students studying Virginia history.

Mabry Mill is located at Milepost 176.1. It can be reached by accessing the Parkway from U.S. 58 at Meadows of Dan and traveling north approximately one mile or by accessing the Parkway at Virginia Route 8 and traveling south approximately eleven miles.



A LOG CABIN FOR EVERYONE?

Goal

Students will compare types of housing and construction to understand how machinery and industrialization affected the lives of many Virginians in the first decades of the twentieth century.

Strand

History and Social Science

Standards of Learning

History and Social Science 4.5, 4.7

Background Information

Mabry Mill is one of the most visited sites on the Parkway and a favorite place for visitors who want to experience remnants of turn-of-the-century Blue Ridge crafts, industry, and community. Mabry Mill was in operation at this site from about 1910-1936 and was the "hub" of the Meadows of Dan community. Ed Mabry and his wife Lizzie ground various grains and operated a small sawmill and blacksmith shop. The site also includes a nineteenth century log cabin and a blacksmith shop. Photographs of the Mabry home on wayside exhibits demonstrate the variety of housing construction existing in the Blue Ridge in the early twentieth century.

Materials Needed

Attached background information on Mabry Mill. Notebook and pencil. Historic photograph of Mabry home (also included on the wayside exhibit on site.)

Suggested Background Readings

A Pioneer Sampler, Barbara Greenwood.
The Blue Ridge Parkway, Harley E. Jolley.
Background material on Mabry Mill.

PRE SITE ACTIVITIES

Discuss the following with children prior to the visit:

Early settlers in many parts of rural America built one-room log cabins, the most efficient and functional shelter for their family. Parkway planners in the 1930s preserved log cabins for their rustic appeal and visually pleasing look. Throughout the latter half of the nineteenth century and into the early twentieth century, local sawmills like Ed Mabry's became a central feature of most Blue Ridge communities, and residents began covering their log homes with siding. The next logical step was whitewashing them with a mixture of lime and water.

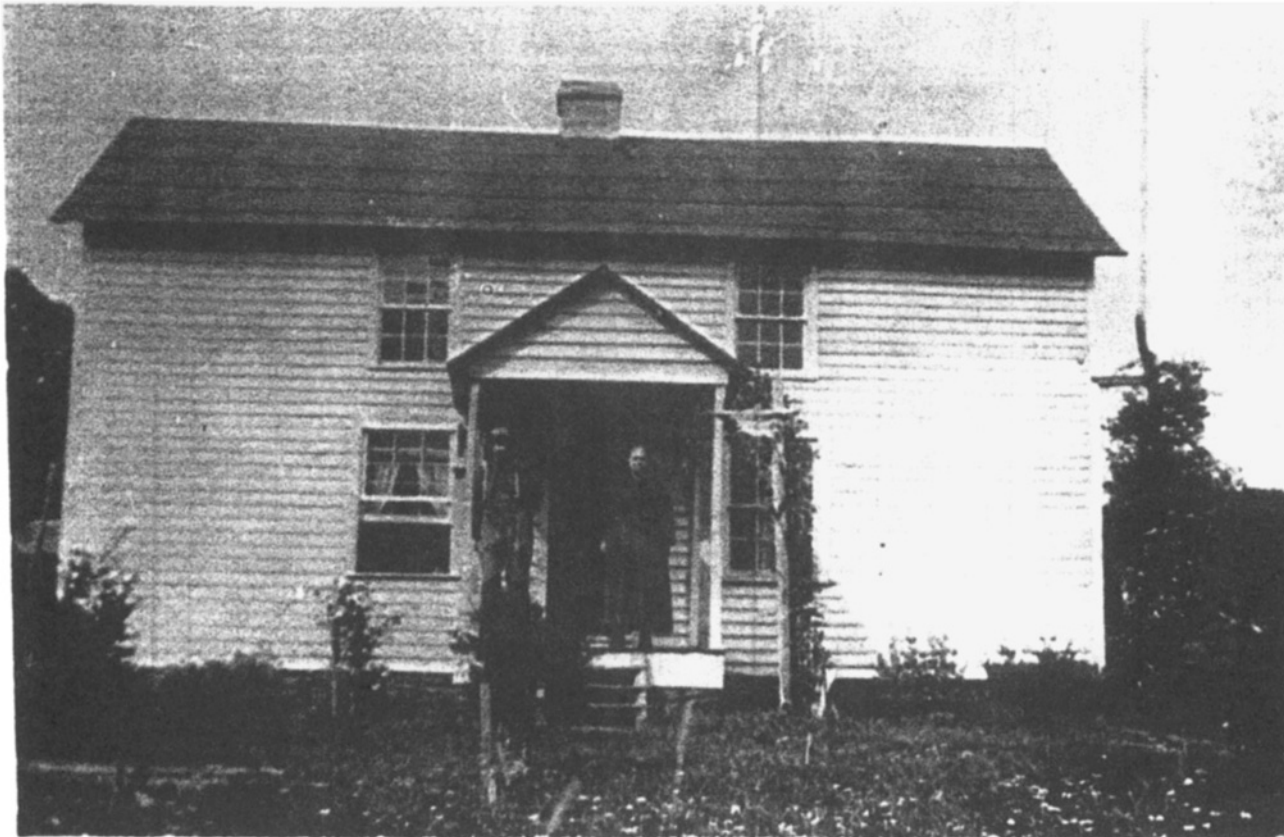
On the drive to Mabry Mill, especially coming from the Roanoke area, have students look for farmhouses and agricultural scenes adjacent to the Parkway.

ON SITE ACTIVITIES

Have students compare the buildings in the Mabry Mill complex with the photograph of Ed and Lizzie Mabry's home. What were the advantages of a home with siding? Did Ed Mabry's sawmill operation make it more likely that those living in this community could build similar houses? Did Ed Mabry put siding on his house as an "advertisement" to draw business?

POST SITE ACTIVITIES

Have students draw three pictures, one of the Matthews Cabin, one of Ed Mabry's house, and one house they noticed along the Parkway.



Ed and Lizzie Mabry on the front porch of their home



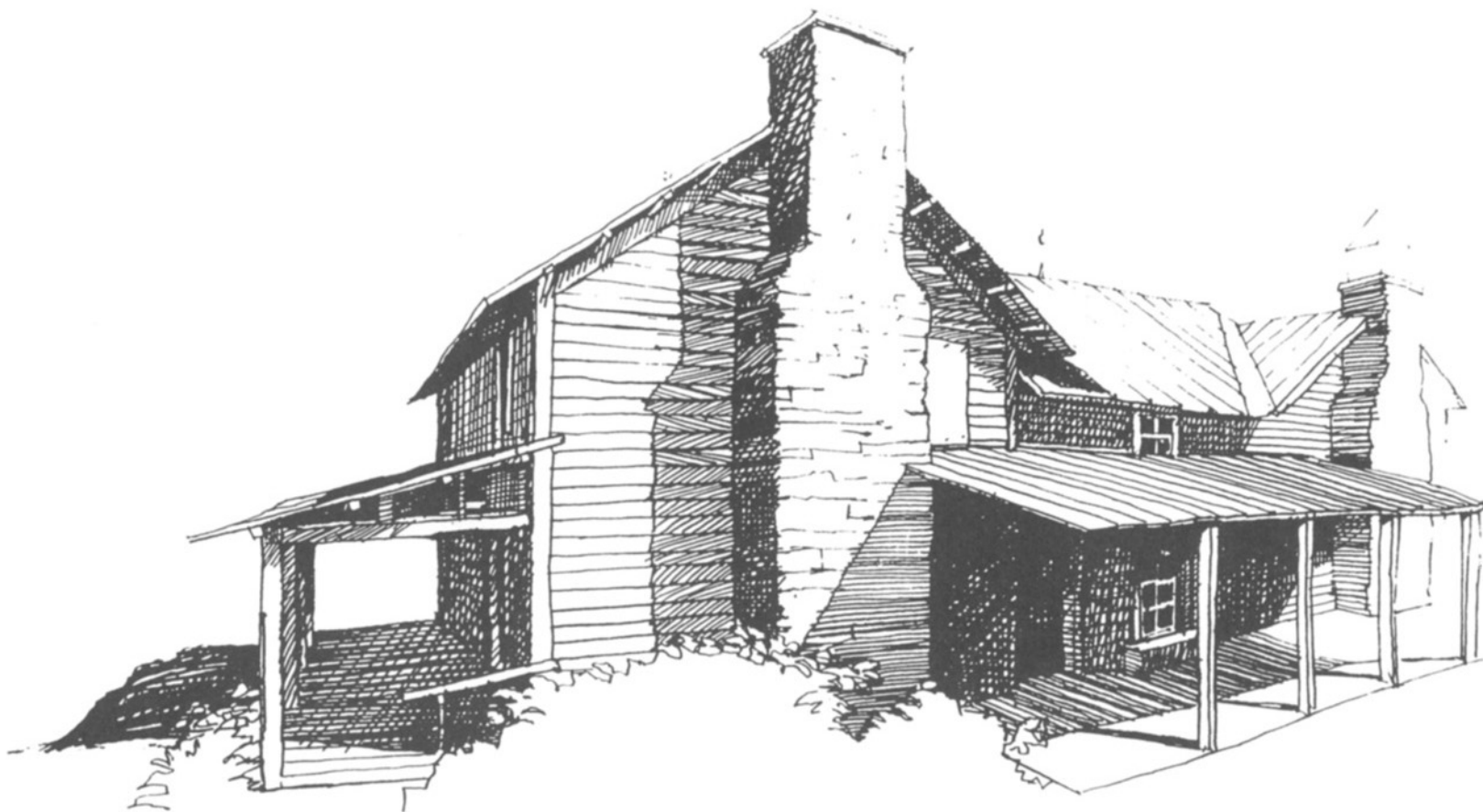
Mountainside Farm Along the Blue Ridge Parkway

Photo by Jim Doane



Brinegar Cabin on the Blue Ridge Parkway

Photo by Eric Schmitt



After many additions, a one-room cabin
becomes more spacious and comfortable.



Many Blue Ridge homes were built as framed structures instead of log cabins.

VISITING MABRY MILL – THEN AND NOW

Goal

The student will develop historical analysis skills including identifying, analyzing and making generalizations about life in Virginia history using primary sources including artifacts, photographs, and documents.

Strand

History and Social Science
English – Writing, Research

Standards of Learning

History and Social Science 4.5, 4.6, 4.7
English 4.7, 4.9

Background Information

Mabry Mill is one of the most visited sites on the Parkway and a favorite place for visitors who want to experience remnants of turn-of-the-century Blue Ridge crafts, industry, and community. Mabry Mill was in operation at this site from about 1910-1936 and was the “hub” of the Meadows of Dan community. Ed Mabry and his wife Lizzie ground various grains and operated a small sawmill and blacksmith shop. The elaborate system of flumes needed to collect enough water to operate the mill provide evidence of Ed’s ingenuity and persistence. The site also includes a nineteenth century log cabin and A blacksmith shop.

Materials Needed

Attached background information on Mabry Mill. Notebook and pencil. Historic photograph of Mabry Mill (also included on wayside exhibit at the site)

Suggested Background Readings

A Pioneer Sampler, Barbara Greenwood.
The Blue Ridge Parkway, Harley E. Jolley.

PRE SITE ACTIVITIES

Teacher needs to discuss background on Mabry Mill with students. Discuss information on gristmills found on pages 144-145 in *A Pioneer Sampler*. Discuss methods of transportation that developed in the mountains culminating with the Blue Ridge Parkway and how life in the mountains changed as roads improved.

ON SITE ACTIVITIES

Using the first wayside exhibit and the background information provided, students will list likenesses and differences between the historic photograph and the current, restored mill. Students should note differences in the building as well as the surrounding landscape.

Students will sketch a picture of the present mill, to be completed in the classroom.

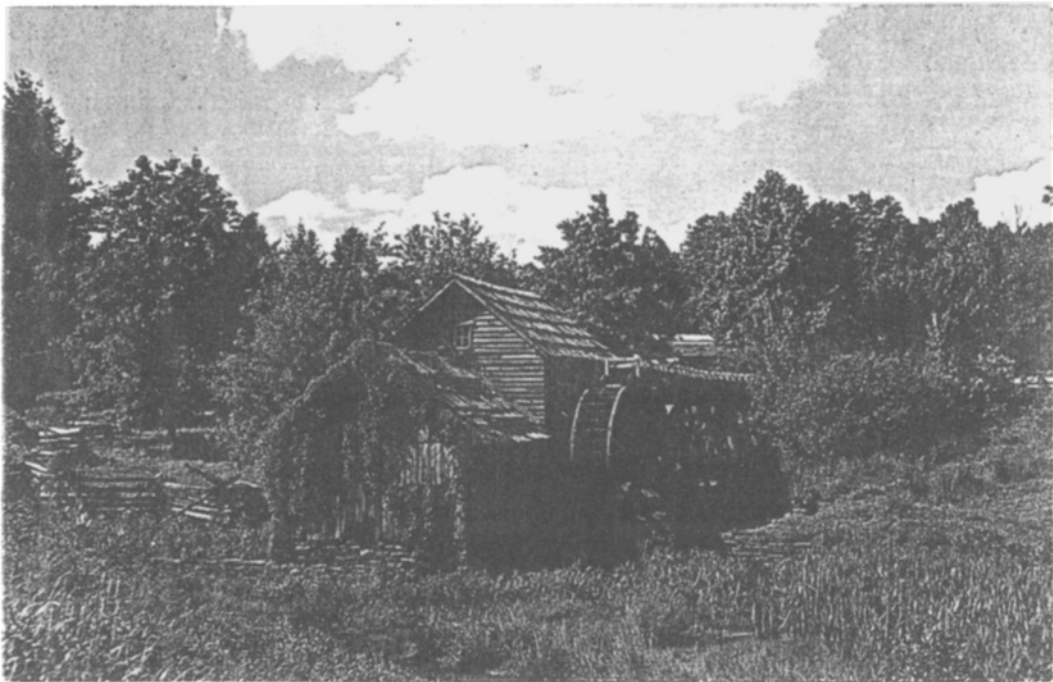
While touring Mabry Mill, teacher should elaborate on the role that a miller had in the community. Students should discuss a “typical” day when folks came to get their meal ground and understand the barter system that often served as payment.

POST SITE ACTIVITIES

Draw pictures of the original gristmill on ½ of a sheet of large drawing paper and the restored gristmill on the other half.

Write a paragraph or paper comparing and contrasting the original mill and the restored mill.

Students will bring to school one item that they no longer want that someone else might find desirable. Using the bartering method, students will trade and barter for each other’s objects. This could also be done with pre-packaged food brought from home.



Mabry Mill as it appears today (above) and as Ed Mabry operated it (below).

FROM TOWN TO COUNTRY

Goal

Students will observe the economic and social transition from a rural, agricultural scene to a more urban, industrialized one and apply this to their study of similar changes in twentieth century Virginia.

Strand

History and Social Science
Science – Living Systems, Resources

Standards of Learning

History and Social Science 4.5, 4.6
Science 4.5, 4.8

Background Information

Mabry Mill is one of the most visited sites on the Parkway and a favorite place for visitors who want to experience remnants of turn-of-the-century Blue Ridge crafts, industry, and community. Mabry Mill was in operation at this site from about 1910-1936 and was the "hub" of the Meadows of Dan community. The site also includes a nineteenth century log cabin and a blacksmith shop. The "high plateau" that the Parkway follows leading to Mabry Mill is heavily agricultural with many homes and farms reminiscent of Virginia in the 1930s and 1940s. The change from towns, cities, and industry to a rural, agricultural scene offers an opportunity to discuss similar changes throughout the Commonwealth in the twentieth century.

Materials Needed

Notebook and pencil. Background material on Mabry Mill.

Suggested Background Readings

Miners, Millhands, and Mountaineers: The Industrialization of the Appalachian South, Ron Eller.

PRE SITE ACTIVITIES

During the study of changes in twentieth century Virginia, discuss with students the industries found close to them and the number of people employed there. Find out how many students' parents or relatives work in various industries or factories. Discuss with them the number of Virginians employed in agricultural jobs today compared with a generation ago.

Have them write down five changes in the scene from industrial to agricultural as they travel to Mabry Mill. Note that the protection of farmland, forests, and an agricultural scene is due, in part, to the coming of the Blue Ridge Parkway.

ON SITE ACTIVITIES

Discuss with students the concept of "community" which existed even in the mountains during Ed Mabry's day. Discuss the concept of bartering agricultural goods for specialized skills such as blacksmithing. Have the students visualize and imagine a gathering of people at the mill, how far they traveled, the importance of visiting with friends and neighbors, and the differences in transportation in a rural, agricultural setting.

In the Mabry Mill handout (attached), discuss the section on changing technology, better roads, the availability of mass-produced goods, and an increasingly cash-based economy in the region.

POST SITE ACTIVITIES

Have the students draw or describe on paper a scene around Ed Mabry's mill that represents the gathering of a community in the early 1900s.

M A B R Y M I L L

Mabry Mill – Then and Now

A cross-country drive or a quick look around our hometowns will confirm that America's landscape is always changing. In national park sites, however, just the opposite is often the case. "I remember this place from our family picnics as a child," visitors will often say. The Blue Ridge Parkway is that kind of place to the many millions of people who have traveled this beautiful road for generations. It has become one of those few things in their lives that seem to remain constant.

Along the Parkway, there is no better example of the enduring past than Mabry Mill. For many visitors, this *is* the Blue Ridge Parkway and the site most often associated with this spectacularly scenic drive between Shenandoah and Great Smoky Mountains National Parks. There is no more recognizable place or any more photographed view than this rustic gristmill near Meadows of Dan, Virginia.

In the early part of the twentieth century, water powered gristmills were a common site in almost every community in the southern mountains. This one isn't particularly distinctive or unique. It would not stand out a generation or two ago as anything more than just a common mill - a necessary service and a gathering place for the local community. The Parkway was designed to nestle gently into the existing landforms and preserve the cultural and natural history of the southern mountains. Ed Mabry's gristmill happened to be located in an area chosen for the new scenic road and it made sense to use this site to emphasize one of the more colorful elements of rural mountain life.

Many sights and sounds familiar to Ed Mabry's generation still exist here. The splash of running water, the steady rhythm of the turning wheel, and the ring of a blacksmith's hammer echoed here long before this place became a visitor attraction. In addition to the sights and sounds common to a mill operation of an earlier generation, today there are more buildings that tell a bigger story of crafts and skills that served families, neighbors, and the larger community. Contemporary visitors can eat lunch, buy stone-ground meal, or join in on the traditional music and dancing on Sunday afternoons.

The way Mabry Mill was then, and the way it is now – either way, it is a Parkway kind of place - yours to enjoy, to learn, and to remember.

The People

Ed Mabry was born in 1867 near the Pinnacles of Dan, Virginia, a tortuous canyon carved by the Dan River and known locally as “The Bent.” At age eighteen, with his new wife, Ed built a cabin and began farming one hundred acres. He supplemented his income by working with his father-in-law making chairs for the neighbors in the community. The two of them built a water-powered lathe for their business, indicative of Ed’s early interest in machinery of various types. Despite his youth, Ed quickly developed a reputation in the community as a man who could fix things. “Carry it on to Ed” was common advice when repairs of any kind were needed.

A few years later, and with a broken marriage behind him, Ed Mabry left home to work in the zinc mines of Pulaski, Virginia. In just two years, he was back in Meadows of Dan, married to Mintoria Lizzie deHart, and farming a newly purchased fifty-acre tract. According to neighbors, Ed’s interest was never in farming. His persistent dream was to own and operate his own mill. In order to fulfill that dream, Ed needed more cash, so in 1896, he and Lizzie moved to the coalfields of West Virginia where Ed established himself as a camp blacksmith. Success in this venture brought the Mabrys back to Virginia and living on the land where Ed would eventually build his long-desired mill and fulfill his dream. His first structure was a blacksmith shop in which he practiced his trade and developed skill in repairing wagons.

“He could do any kind of work,” one neighbor recalled. “Ironwork or any kind of metal, he could do it in the shop... and woodwork... as nice as anybody in the county.”

By 1910, Ed’s persistence, willingness to work jobs that would give him the initial capital, and his drive and ingenuity paid off. He finally built a water-powered mill that would become a focal point of this close-knit mountain community. A company in Mount Airy, North Carolina supplied the cast iron gears according to Ed’s specifications, and his first set of millstones came from the Brushy Mountain quarry near Blacksburg, Virginia. With his fascination for gadgets and skill at using almost any tool, Ed built the rest of the mill himself

His land, however, was unusually flat and without a stream that carried sufficient force to generate power for milling. So the Mabry’s began purchasing land in order to secure more waterpower. Small tracts of one quarter to three acres were adequate as long as the water rights were granted in the deed. Between 1905 and 1914, they purchased five small parcels and built an extensive flume system. A small dam stored the runoff from rains and spring thaws.

The Operation

Water-powered gristmills were already common in the southern mountains when Ed Mabry built this one just after the turn of the century. It was smaller than most, but together with the blacksmith shop he already operated and the sawmill and woodworking tools he added in later years, the mill attracted a sizable number of customers. Neighbors in the community appreciated Ed's resourcefulness, ingenuity, and hard work.

The Mabrys actually operated two mills or sets of stones connected by belts to the drive shaft of the waterwheel. One of this ground cornmeal and the other ground "chop," a mixture of grains fed to livestock. The round stones used in this type of mill were shaped at the quarry, but it was the miller's responsibility to "dress" the stones by making furrows in the grinding surfaces with a double-headed pick, a tool that Ed Mabry could easily fashion and sharpen in his blacksmith's shop.

The distance between the millstones was critical in the grinding process. A good miller could determine if the stones were adjusted properly by feeling the ground corn in his hand. The rate at which the stones turned also helped determine the quality of meal. Too much friction and heat could give the meal a burned taste. The fact that the Mabrys always struggled at this site for enough water to turn the mill wheel probably helped them in the long run to grind better tasting meal.

Perhaps it was a combination of the Mabry's expertise and the superior, slower grinding process that distinguished this mill from its larger competitors. Several local mills ground wheat or buckwheat in addition to cornmeal. Many of them had bolters, rotating cylindrical screens that separated the fragments of ground grain according to size. Corn, for example, yielded three products: cornmeal, grits, and a coarser grind of cracked corn called bran, usually fed to poultry. The Mabrys had no bolter, but their loyal customers were willing to carry sacks of ground corn home and sift out the cornmeal and grits on their own.

Sometime after 1910, Ed connected a circular saw to the water wheel. He salvaged gears from an old threshing machine, and purchased other essential parts, probably through mail order. Logs were moved on a carriage, a low, wooden frame that rolled along steel tracks. A single man could operate the sawmill with levers that controlled a homemade clutch and the series of gears. Ed could saw five hundred board feet of timber a day, yielding everything from two by fours and framing materials to lumber for local furniture makers.

After his sawmill was in place, Ed sawed the lumber to add a carpentry shop to his mill. The water wheel powered all the tools, and no one in the region had a more elaborate set-up than Ed Mabry. A planer, tongue-and-groove jointer, grindstone, and a double bladed jigsaw were among the various implements this versatile man used to provide services to his community and to make a living.

The Community

Gristmills were an integral part of America's past. Preserved mills today are beautiful and picturesque attractions, providing inspiration for writers, poets and photographers. Usually, however, they are inactive and a sharp contrast to the bustle of activity during their days of production. Even in some of the rugged sections of the Blue Ridge, there were communities and neighbors connected to and dependent on each other.

A local mill like the Mabry's served as a community hub. People came and went constantly. In many communities, the local mill was an information center where neighbors caught up on the latest news. It was an inviting place and the owner usually enjoyed the esteem of neighbors. The operation was so essential that the miller may have been exempt from other public service duties like road repair. More often than not, the miller bartered or traded his service. Customers usually brought about two bushels of shelled corn to the mill at one time. The Mabrys charged their customers one-eighth of the amount of corn brought for milling.

Ed and Lizzie interacted with people from all over the county and had the reputation of being hard-working, honest neighbors. Ed got to know the people who visited the mill. He learned their names and came to know them in depth – who they were, what they did, how many children they had, and their hopes and dreams. He gave each customer patient, personal attention. Likewise, the community grew to know and love the Mabrys. They trusted their work, and faithful customers boasted that the Mabrys ground the best meal in the area. Ed and Lizzie's response to the community was just as supportive, and they were ever ready to reach out and lend a helping hand.

According to one neighbor, Ed "tended to his own business. He didn't bother anybody, and I never did hear him speak a harm[ful] word about anybody. And I never knew of anybody having a working around here that old man Ed Mabry didn't go and help, and he was a good hand at anything he went at."

In later years, Ed's health declined and he found it increasingly difficult to maintain his mill and, especially to constantly repair the flumes. To get around the need for waterpower, he bought a small, kerosene engine to power the mill. He died in 1936, but Lizzie, resourceful like her husband, operated the mill for a while on her own.

By the late 1930s, locally-owned, water powered mills were declining in Blue Ridge communities due to changing technology. Better roads came into the mountains, facilitating travel to larger towns. Mass produced, manufactured goods were more easily obtained and communities no longer felt dependent on the miller, woodworker, and blacksmith. Larger and more efficient mills in towns offered products at cheaper prices and the overall economy of the region was becoming increasingly based on cash rather than the barter of goods. Young people found it more appealing to move to larger towns for factory work than follow in the agrarian footsteps of their parents.

The Park

On September 11, 1935, just inside the North Carolina state line, construction workers turned the first shovel of dirt for the Blue Ridge Parkway. This recreational motor road, designed to link Shenandoah and Great Smoky Mountains National Parks, provided a significant economic counter to the effects of the Great Depression on the people of the Blue Ridge. The "Scenic" as it was often called, created training and jobs for local residents. It also provided construction contracts for companies who bid on the various sections of roadway and bridges.

The Parkway was a tremendous undertaking. Working cooperatively, the National Park Service designers, state highway engineers, and the Bureau of Public Roads attempted to marry the roadway to the landscape. In addition, designers carefully selected and preserved many log buildings, homes, and other rustic and colorful cultural structures along the Blue Ridge. The project was a landscape architect's dream; an opportunity to mold and shape a beautiful scene that also enhanced the driving experience.

As Parkway landscape architect Stan Abbott later commented, "I can't imagine a more creative job than locating the Blue Ridge Parkway. The moss and lichens on the shake roof of Mabry Mill measured against huge panoramas that look out forever." This was his reward for the years of design and planning that took place here. Abbott and other landscape architects, engineers, and highway department officials traveled extensively through the region designated for the Parkway. They immediately chose Mabry Mill as one of the special scenic places to be preserved in this section of the park.

Photographs from the late 1930s and 1940s do not show a nicely manicured site with the reflecting pool that greets visitors today. Instead, the site was much more unkempt in appearance. Water coming off of the waterwheel fed into a marshy grassland and the mill showed the effects of having been closed and largely neglected. Still, designers quickly recognized its aesthetic possibilities.

All along the new scenic roadway, the landscape architects' tried to create a picturesque scene rather than a historically faithful one. They sometimes removed buildings and replaced them with ones more quaint and of more interest to the travelers. Such was the case at the Mabry complex. Ed and Lizzie's two story framed house was removed and a log cabin brought in and reassembled. To the landscape architects, the current Matthews Cabin seemed well suited to the landscape, even though it was not authentic to the site.

Over the years, the nostalgic appeal of the site has endured. Today, Mabry Mill remains a focal point of the community and a gathering place for neighbors. Weekends at the Mill, especially during the fall color season, can mean bumper to bumper traffic. Music and dancing are common, and the smell of cooking apple butter settles around the Mill. Images of Mabry Mill grace magazine covers and postcards across the country and sometimes around the world. Everyone, it seems, wants to capture this place on film, on canvas, or maybe just in the mind. A trip down the Blue Ridge Parkway represents many things to many people, but Mabry Mill ranks near the top of the list as a place to glimpse one of the most appealing symbols of America's past and as a place to remember.

WATER POWERED ENERGY AT MABRY MILL

Goal

The student will write a paragraph discussing how Mabry Mill takes potential energy and turns it into kinetic energy.

Strand

Science – Force, Motion, and Energy
Social Studies
English – Writing

Standards of Learning

Science 4.2
Social Studies 4.2, 4.3
English 4.7

Background Information

Mabry Mill is one of the most visited sites on the Parkway and a favorite place for visitors who want to experience remnants of turn-of-the-century Blue Ridge crafts, industry, and community. Mabry Mill was in operation at this site from about 1910-1936 and was the “hub” of the Meadows of Dan community. Ed Mabry and his wife Lizzie ground various grains and operated a small sawmill and blacksmith shop. The elaborate system of flumes needed to collect enough water to operate the mill provide evidence of Ed's ingenuity and persistence. The site also includes a nineteenth century log cabin and A blacksmith shop.

Materials Needed

Notebook and pencil

Suggested Background Readings

The Gristmill, Bobbie Kalman. *A Pioneer Sampler*, Barbara Greenwood.

PRE SITE ACTIVITIES

Students and teacher should discuss potential and kinetic energy along with simple and complex machinery. Discuss grist mills and how they affected the local economy of rural communities. Lead students in a discussion of why grist mills were a needed service.

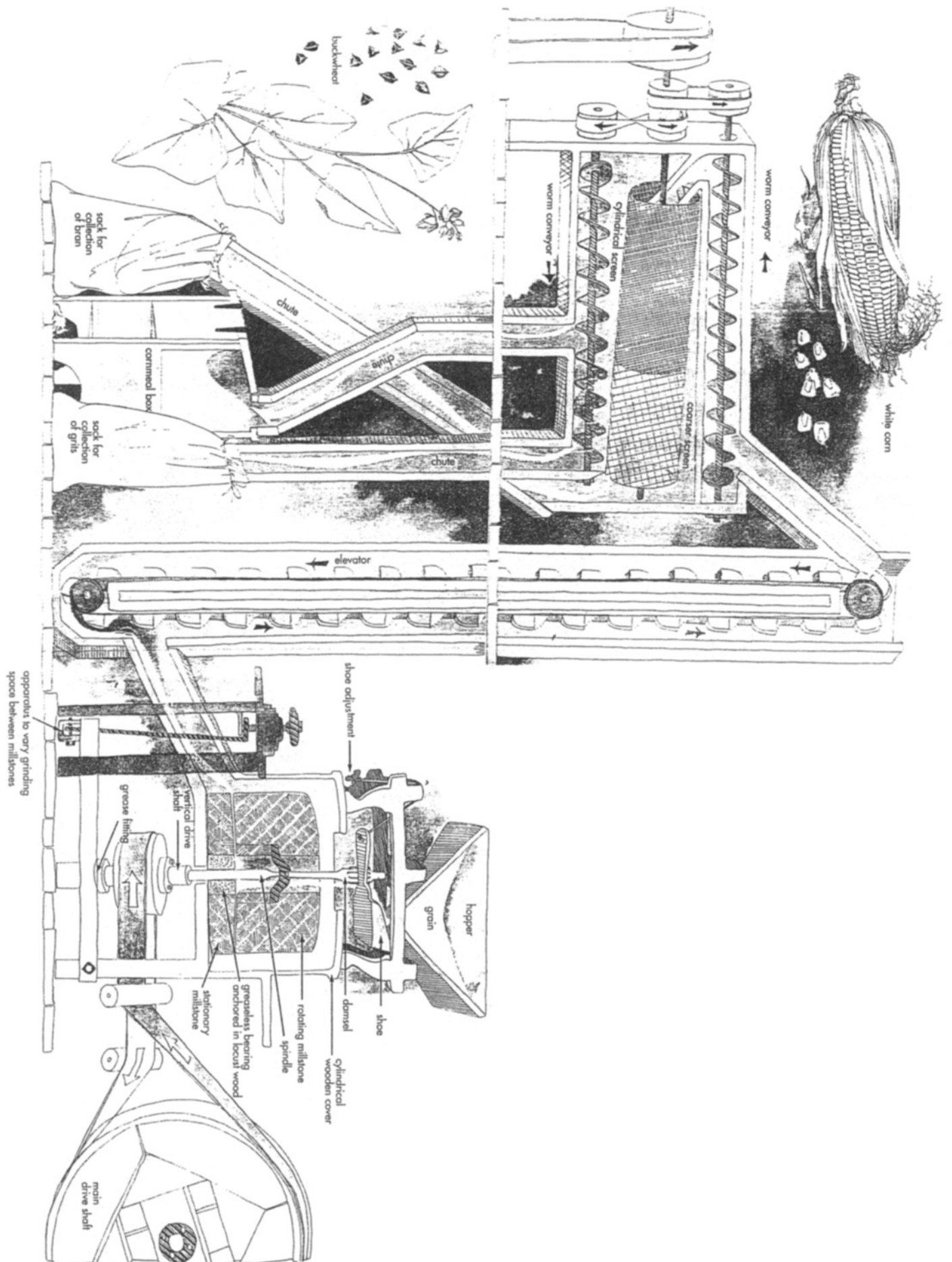
ON SITE ACTIVITIES

Tour Mabry Mill and discuss how Ed and Lizzie Mabry's operation assisted the local community. Students should understand that mills were common to almost all communities in the late 1800s and early 1900s. Discuss what part of the mill is a simple machine. Follow the flumes toward the water source and discuss the process of gaining enough water power to effectively operate the mill.

Teachers should relate to the students that in its final year(s) of operation, the Mabry's changed to a kerosene-powered engine to drive the mill. As roads and transportation increased, and people began to work more in factories in the lowland towns where manufactured goods were available, the need for a local, “community” mill decreased significantly.

POST SITE ACTIVITIES

Students will write a paragraph or paper about how Mabry Mill uses potential energy and turns it into kinetic energy.



CHANGING TIMES AT MABRY MILL

Goal

Students will utilize the Mabry Mill site to evaluate the economic and social transition from a rural, agricultural society to a more urban, industrialized society in Virginia from the 1870s to the early twentieth century.

Strand

History and Social Science
English – Oral Language, Reading/Literature,
Writing

Standards of Learning

History and Social Science 4.5, 4.6
English 4.1, 4.2, 4.3, 4.4, 4.5, 4.7, 4.8

Background Information

Mabry Mill is one of the most visited sites on the Parkway and a favorite place for visitors who want to experience remnants of turn-of-the-century Blue Ridge crafts, industry, and community. Mabry Mill was in operation at this site from about 1910-1936 and was the “hub” of the Meadows of Dan community. The site also includes a nineteenth century log cabin and a blacksmith shop. The “high plateau” that the Parkway follows leading to Mabry Mill is heavily agricultural with many homes and farms reminiscent of Virginia in the 1930s and 1940s. The change from towns, cities, and industry to a rural, agricultural scene offers an opportunity to discuss similar changes throughout the Commonwealth in the twentieth century.

Materials Needed

Notebook and pencil.

Suggested Background Reading

Miners, Millhands, and Mountaineers: The Industrialization of the Appalachian South,

Ron Eller. Handout material on Mabry Mill.
The Gristmill, Bobbie Kalman.

PRE SITE ACTIVITIES

Read and discuss *A Pioneer Sampler*, emphasizing social and economic opportunities and changes that may apply to Virginia society. Read and discuss *The Gristmill*, drawing a sequence picture to show how a mill was built. Have the students write captions for each picture that describe the steps. Identify the terms gristmill, miller, milldam, millrace, gear, millstones, and barter. Create two Venn diagrams, one that compares social life and one that compares economic life today verses the descriptions contained in *A Pioneer Sampler*.

ON SITE ACTIVITIES

Discuss the advantages of bringing products to a community gristmill compared to grinding them at home. Have the students identify other services that were available to people when they brought grain to the mill.

Have the students create a chart and, as a group, discuss life in the region prior to 1900, during the Mabry Mill era (1910-1936), and after the Mabry Mill era (including the coming of the Parkway). Include references to food service, social interactions, primary industries, schooling, clothing, and transportation.

POST SITE ACTIVITIES

Review the pre-site Venn diagrams and discuss and changes related to things learned at Mabry Mill and reasons why the mill operation closed down. Sketch a picture of the Mabry Mill operation.

MATHEMATICS STANDARDS OF LEARNING

The fourth-grade standards place emphasis on division with whole numbers and solving problems involving addition and subtraction of fractions and decimals. Students will continue to learn and use the basic multiplication facts as they become proficient in multiplying larger numbers. Students also will refine their estimation skills for computations and measurements and investigate the relationships between and among points, lines, segments, and rays. Concrete materials will be used to solve problems involving perimeter, patterns, and probability. While learning mathematics, students will be actively engaged, using concrete materials and appropriate technologies such as calculators and computers. However, facility in the use of technology shall not be regarded as a substitute for a student's understanding of quantitative concepts and relationships or for proficiency in basic computations. Students also will identify real-life applications of the mathematical principles they are learning that can be applied to science and other disciplines they are studying.

Mathematics has its own language, and the acquisition of specialized vocabulary and language patterns is crucial to a student's understanding and appreciation of the subject. Students should be encouraged to use correctly the concepts, skills, symbols, and vocabulary identified in the following set of standards.

Problem solving has been integrated through the six content strands. The development of problem-solving skills should be a major goal of the mathematics program at every grade level. Instruction in the process of problem solving will need to be integrated early and continuously into each student's mathematics education. Students must be helped to develop a wide range of skills and strategies for solving a variety of problem types.

Number and Number Sense

4.1 The student will

- Identify, orally and in writing, the place value for each digit in a whole number expressed through millions
- Compare two whole numbers, expressed through millions, using symbols ($>$, $<$, or $=$)
- Round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.

4.2 The student will identify and represent equivalent fractions and relate fractions to decimals, using concrete objects.

4.3 The student will compare the numerical value of fractions having denominators of 12 or less.

4.4 The student will read, write, represent, and identify decimals expressed through thousandths, and round to the nearest tenth and hundredth, using concrete materials, drawings, calculators, and symbols.

Computation and Estimation

- 4.5 The student will create and solve problems involving addition and subtraction of money amounts using various computational methods, including calculators, paper and pencil, mental computation, and estimation.
- 4.6 The student will estimate whole-number sums and differences and describe the method of estimation. Students will refine estimates, using terms such as closer to, between, and a little more than.
- 4.7 The student will add and subtract whole numbers written in vertical and horizontal form, choosing appropriately between paper and pencil methods and calculators.
- 4.8 The student will find the product of two whole numbers when one factor has two digits or less and the other factor has three digits or less, using estimation and paper and pencil. For larger products (a two-digit numeral times a three-digit numeral), estimation and calculators will be used.
- 4.9 The student will estimate and find the quotient of two whole numbers given a one-digit divisor.
- 4.10 The student will
- Add and subtract with fractions having like and unlike denominators of 12 or less and with decimals through thousandths, using concrete materials and paper and pencil; and
 - Solve problems involving addition and subtraction with fractions having like and unlike denominators of 12 or less and decimals expressed through thousandths.

Measurement

- 4.11 The student will
- Estimate and measure weight/mass using actual measuring devices and express the results in both metric and U.S. Customary units, including ounces, pounds, grams, and kilograms; and
 - Estimate the conversion of ounces and grams and pounds and kilograms, using approximate comparisons (1 ounce is about 28 grams, or 1 gram is about the weight of a paper clip; 1 kilogram is a little more than 2 pounds.)
- 4.12 The student will
- Estimate and measure length using actual measuring devices and describe the results in both metric and U.S. Customary units, including part of an inch ($\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$), inches, feet, yards, millimeters, centimeters, and meters; and
 - Estimate the conversion of inches and centimeters, yards and meters, and miles and kilometers, using approximate comparisons (1 inch is about 2.5 centimeters, 1 meter is

a little longer than 1 yard, 1 mile is slightly farther than 1.5 kilometers, or 1 kilometer is slightly farther than half a mile.)

4.13 The student will

- Estimate and measure liquid volume using actual measuring devices and using metric and U.S. Customary units, including cups, pints, quarts, gallons, milliliters, and liters; and
- Estimate the conversion of quarts and liters, using approximate comparisons (1 quart is a little less than 1 liter, 1 liter is a little more than 1 quart.)

4.14 The student will identify and describe situations representing the use of perimeter and will use measuring devices to find perimeter in both standard and non-standard units of measure.

Geometry

4.15 The student will investigate and describe the relationships between and among points, lines, line segments, and rays.

4.16 The student will identify and draw representations of points, lines, line segments, rays, and angles, using a straightedge or ruler.

4.17 The student will identify lines which illustrate intersection, parallelism, and perpendicularity.

Probability and Statistics

4.18 The student will determine the probability of a given simple event, using concrete materials.

4.19 The student will collect, organize, and display data in line and bar graphs with scale increments of one or greater than one.

Patterns, Functions, and Algebra

4.19 The student will identify and locate missing whole numbers on a given number line.

4.20.1 The student will extend a given pattern, using concrete materials and tables.

4.20.2 The student will solve problems involving pattern identification and completion of patterns.

SCIENCE STANDARDS OF LEARNING

The fourth-grade standards stress the importance of using information, analyzing data, and validating experimental results. Defining variables in experimentation is emphasized, and making simple predictions from picture, bar, and line graphs is underscored. Questioning and hypothesizing become more detailed at this level. Students are introduced to basic principles of electricity and to the concept of energy as it relates to work and machines. Relationships are investigated in the interactions among the Earth, moon, and sun and among plants and animals and their environments. In examining weather phenomena and conditions, students identify various factors, make predictions based on data, and evaluate the results. The importance of natural resources in Virginia is emphasized.

Scientific Investigation, Reasoning, and Logic

4.1 The student will plan and conduct investigations in which

- Distinctions are made among observations, conclusions (inferences), and predictions
- Data are classified to create frequency distributions;
- Appropriate metric measures are used to collect, record, and report data;
- Appropriate instruments are selected to measure linear distance, volume, mass, and temperature;
- Predictions are made based on data from picture graphs, bar graphs, and basic line graphs;
- Hypotheses are formulated based on cause and effect relationships;
- Variables that must be held constant in an experimental situation are defined; and
- Numerical data that are contradictory or unusual in experimental results are recognized.

Force, Motion, and Energy

4.2 The student will investigate and understand that energy is needed to do work and that machines make work easier. Key concepts include

- Energy forms (electrical, mechanical, and chemical energy);
- Potential and kinetic energy;
- Simple and complex machines; and
- Efficiency, friction, and inertia.

4.3 The student will investigate and understand the characteristics of electricity. Key concepts include

- The nature of electricity (voltage, ampere, resistance, conductors, and insulators)
- Circuits (open/closed, parallel/series)
- Magnetism and magnetic fields

- Static electricity
- Historical contributions in understanding electricity.

Life Processes

4.4 The student will investigate and understand basic plant anatomy and life processes. Key concepts include

- The structures of typical plants (leaves, stems, roots, and flowers);
- Processes and structures involved with reproduction (pollination, stamen, pistil, sepal, embryo, spore, and seed);
- Photosynthesis (chlorophyll, carbon dioxide); and
- Dormancy

Living Systems

4.5 The student will investigate and understand how plants and animals in an ecosystem interact with one another and the nonliving environment. Key concepts include

- Behavioral and structural adaptations;
- Organization of communities;
- Flow of energy through food webs;
- Habitats and niches;
- Life cycles; and
- Influence of human activity on ecosystems.

Interrelationships in Earth/Space Systems

4.6 The student will investigate and understand how weather conditions and phenomena occur and can be predicted. Key concepts include

- Weather factors (temperature, air pressure, fronts, formation and type of clouds, and storms); and
- Meteorological tools (barometer, hygrometer, anemometer, rain gauge, and thermometer).

Earth Patterns, Cycles, and Change

4.7 The student will investigate and understand the relationships among the Earth, moon, and sun. Key concepts include

- The motions of the Earth, moon and sun (revolution and rotation);
- The causes for the Earth's seasons and phases of the moon;
- The relative size, position, and makeup of the Earth, moon, and sun;
- Unique properties of the Earth as a planet and as part of the solar system; and
- Historical contributions in understanding the Earth-moon-sun system

Resources

4.8 The student will investigate and understand important Virginia natural resources. Key concepts include

- Watershed and water resources;
- Animals and plants, both domesticated and wild;
- Minerals, rocks, ores, and energy sources; and
- Forests, soil, and land.

ENGLISH STANDARDS OF LEARNING

The fourth grade student will communicate orally in large- and small-group settings. Students will read classics and contemporary literature by a variety of authors. A significant percentage of reading material will relate to the study of math, science, and history and social science. The student will use text organizers, summarize information, and draw conclusions to demonstrate reading comprehension. Reading, writing, and reporting skills support an increased emphasis on content-area learning and on utilizing the resources of the media center, especially to locate and read primary sources of information (speeches and other historical documents) related to the study of Virginia. Students will plan, write, revise, and edit narratives and explanations. The student will routinely use information resources and word references while writing.

Oral Language

4.1 The student will use effective oral communication skills in a variety of settings.

- Present accurate directions to individuals and small groups.
- Contribute to group discussions.
- Seek the ideas and opinions of others.
- Begin to use evidence to support opinions.

4.2 The student will make and listen to oral presentations and reports.

- Use subject-related information and vocabulary.
- Listen to and record information.
- Organize information for clarity.

Reading/Literature

4.3 The student will read and learn the meanings of unfamiliar words.

- Use knowledge of word origins; synonyms, antonyms, and homonyms; and multiple meanings of words.
- Use word-reference materials including the glossary, dictionary, and thesaurus.

4.4 The student will read fiction and nonfiction, including biographies and historical fiction.

- Explain the author's purpose.
- Describe how the choice of language, setting, and information contributes to the author's purpose.
- Compare the use of fact and fantasy in historical fiction with other forms of literature.
- Explain how knowledge of the lives and experiences of individuals in history can relate to individuals who have similar goals or face similar challenges.

4.5 The student will demonstrate comprehension of a variety of literary forms.

- Use text organizers such as type, headings, and graphics to predict and categorize information.
- Formulate questions that might be answered in the selection.
- Make inferences using information from texts.
- Paraphrase content of selection, identifying important ideas and providing details for each important idea.
- Describe relationship between content and previously learned concepts or skills.
- Write about what is read.

4.6 The student will read a variety of poetry.

- Describe the rhyme scheme (approximate, end, and internal).
- Identify the sensory words used and their effect on the reader.
- Write rhymed, unrhymed, and patterned poetry.

Writing

4.7 The student will write effective narratives and explanations.

- Focus on one aspect of a topic.
- Develop a plan for writing.
- Organize writing to convey a central idea.
- Write several related paragraphs on the same topic.
- Utilize elements of style, including word choice, tone, voice, and sentence variation.
- Edit final copies for grammar, capitalization, punctuation, and spelling.
- Use available technology.

4.8 The student will edit final copies of writings.

- Use subject-verb agreement.
- Avoid double negatives.
- Use pronoun "I" correctly in compound subjects.
- Use commas in series, dates, and addresses.

Research

4.9 The student will use information resources to research a topic.

- Construct questions about a topic.
- Collect information, using the resources of the media center.
- Evaluate and synthesize information for use in writing.
- Use available technology.

HISTORY AND SOCIAL SCIENCE STANDARDS OF LEARNING

The standards for fourth-grade students allow them to explore the rich history of Virginia from 1607 to the present. Geographic, economic, and civic concepts continue to be presented within this historic context. Students should use geographic tools to analyze the influence of physical and cultural geography on Virginia history. Fourth graders should also focus on concepts of economic interdependence and the historic ideas that form the foundation of political institutions in Virginia and the United States. Historic and current examples of monetary exchange, credit, and taxation should be compared, and students should begin examination of constitutional documents and the structure and operation of state government.

- 4.1 The student will explain the impact of geographic factors in the expansion and development of Virginia, with emphasis on
- The location of American Indians, various European settlers, and African slaves; and
 - The location and growth of cities in relation to the Atlantic Ocean, the Chesapeake Bay, major rivers, the fall line/fall zone, and the Shenandoah Valley.
- 4.2 The student will use the concepts of absolute location (e.g., using grid systems) and relative location (e.g., direction, reference to neighboring states, and water features) to
- Locate and identify on maps and globes his/her local city or county, Virginia, the other original states, the United States, Western Europe, and West Africa;
 - Explain how physical characteristics, transportation routes, climate, and specialization influenced the variety of crops, products, and industries and the general patterns of economic growth in Virginia;
 - Illustrate how communities in Virginia differ in physical features, such as land use, population density, architecture, services, and transportation; and
 - Construct physical maps and three-dimensional models that include the essential map elements and the geographic regions of Virginia (Tidewater, Piedmont, Ridge and Valley, Allegheny Plateau), and the U.S. (Coastal Plains, Appalachian Mountains, Interior Lowlands, Great Plains, Rocky Mountains, Basin and Ridge, Coastal Range.)
- 4.3 The student will explain the economic, social, and political life of the Virginia colony, with emphasis on
- Its political and economic relationship to England and other nations;
 - Characteristics and contributions of various groups of people;
 - The role of money, banking, saving, and credit in colonial Virginia;
 - Reasons for, and Virginia's role in, the American Revolution;
 - The backgrounds, motivations, and contributions of George Washington, George Wythe, Thomas Jefferson, James Madison, James Monroe, Patrick Henry, and other prominent Virginians in the Revolutionary era; and
 - The significance of the Charters of the Virginia Company of London, the Virginia Declaration of Rights, the Virginia Statute of Religious Freedom, and the Declaration of Independence.

- 4.4 The student will describe the social and political life of Virginians between the Revolutionary War and the end of the Civil War, with emphasis on
- The contributions of Virginians to the establishment of the U.S. Constitution and Bill of Rights, and the success of the new national government;
 - Conflicts between northern and southern states and within Virginia, including Nat Turner's Rebellion, and events leading to secession; and
 - Virginia's role in the Civil War, including major battles and leaders in the Confederate army, including Robert E. Lee, J.E.B. Stuart, and Thomas "Stonewall" Jackson.
- 4.5 The student will evaluate the social, political, and economic life in Virginia from the Reconstruction Period to the 20th century, with emphasis on
- The Reconstruction Period and its impact on politics and government, the economy, demographics, and public opinion;
 - The impact of segregation and Jim Crow laws; and
 - The economic and social transition from a rural, agricultural society to a more urban, industrialized society.
- 4.6 The student will trace the history of Virginia in the 20th century, with emphasis on
- The accomplishments of prominent Virginians, including Woodrow Wilson, Harry F. Byrd, Sr., L. Douglas Wilder, and Arthur Ashe;
 - Social and political events linked to desegregation and Massive Resistance and their relationship to national history;
 - The impact of advances in transportation and communication on migration, economic development, and the integration of Virginia into the U.S. economy and eastern Virginia into the northeast megalopolis
 - The role of money, banking, saving, and credit in contemporary Virginia; and
 - The types of taxes collected and the types of services provided by each level of government
- 4.7 The student will develop historical analysis skills including
- Identifying, analyzing, and making generalizations about the life in Virginia history using primary sources including artifacts, diaries, letters, photographs, art, documents, and newspapers;
 - Distinguishing fact from fiction by comparing documentary sources on historical figures and events with fictionalized characters and events; and
 - Summarizing and sequencing major events in Virginia history from 1607 to the present and locating significant places and events on a map.